INTERACTIONS BETWEEN AXIAL AND TRANSVERSE DRAINAGE SYSTEMS IN THE LATE CRETACEOUS CORDILLERAN FORELAND BASIN: EVIDENCE FROM DETRITAL ZIRCONS IN THE STRAIGHT CLIFFS FORMATION, SOUTHERN UTAH

by

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STATEMENT OF THESIS APPROVAL

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ABSTRACT

New detrital zircon geochronologic data from the Straight Cliffs Formation of southern Utah provide insight into the controls on stratigraphic architecture of the Western Interior basin during Turonian-Campanian time. Straight Cliffs Formation deposition was influenced by the development of topography in the Sevier fold-thrust belt, but to date, little emphasis has been placed on the tectonic development of the Mogollon highlands of central Arizona.

Detrital zircon ages (N=40, n=3650) derived from linked fluvial and shallow marine depositional systems throughout the Kaiparowits Plateau indicate the majority of fluvial sediment was derived from the Mogollon highlands (67%), with subordinate contributions delivered from the Sevier thrust belt (17%) and Cordilleran volcanic sources (16%). The proportion of Sevier detritus increases upsection from 17% in basal fluvial samples to 27% in uppermost strata. Fluvial strata record sediment transport sub-parallel to the Sevier thrust belt, implying the presence of a northeast-flowing axial fluvial system fed by transverse distributive fluvial systems (DFSs) draining the Mogollon highlands and Sevier thrust belt. Shallow marine samples contain Mogollon (44%), volcanic arc (14%), and an increase (relative to contemporaneous fluvial strata) of Sevier thrust belt-derived sediment (42%), which was delivered via longshore currents into southern Utah.

Upsection architectural trends in the Straight Cliffs Formation are linked to trends in detrital zircon geochronologic data, indicating that the driving force behind provenance changes also influenced stratigraphic architecture in the Cordilleran foreland basin. The axial fluvial system depositing Straight Cliffs alluvial strata was primarily fed by distributive fluvial systems (DFS) draining the Mogollon highlands during a period of high tectonic activity in the Maria thrust belt and high subsidence rates in the foreland basin (Turonian-Santonian). However, activation of the Paxton duplex in the Sevier thrust belt (early Campanian) uplifted proximal foreland basin strata and enabled DFSs draining the Sevier thrust belt to feed into the axial fluvial system more prominently. This influx of Sevier-derived sediment into the axial fluvial system was recorded by a shift in detrital zircon ages and sandstone modal composition of Straight Cliffs fluvial strata.

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INTRODUCTION

The stratigraphic architecture of foreland basin deposits is a key component for understanding basin geodynamics, regional tectonic evolution, and distribution of sedimentary facies. In foreland basin systems, sediment delivery and facies architecture is controlled by complex interactions of tectonic subsidence and sediment loading (Dickinson, 1974; Cross and Pilger, 1978; Allen et al., 1986; DeCelles and Giles, 1996; Horton et al., 2004), eustatic and relative sea level (Shanley and McCabe, 1991; Olsen et al., 1995; Van Wagoner, 1995; Atchley et al., 2004), climate (Leeder et al., 1998; Demko et al., 2004), autogenic depositional patterns (Stouthamer and Berendsen, 2007; Hartley et al., 2010; Weissmann et al., 2010), and exhumation of hinterland source areas (Tucker and Slingerland, 1996). The interplay among these factors influences the nature of sedimentation in foreland basins, including many elements of fluvial architecture, such as channel width and depth (Gibling, 2006), bed-load grain sizes (Dade, 2000), channel sinuosity (Ikeda, 1989; Timár, 2003), clustering (Hajek et al., 2010), and stacking patterns (Schwans, 1995; Heller and Paola, 1996; Wang et al., 2011).

Modern foreland basin systems contain both transverse and axial rivers that deliver and redistribute sediment throughout the basin. A prime example includes the Ganges and Yamuna Rivers in the Himalayan foreland basin (Figure 1A), which comprise a major axial drainage system flowing over 2500 kilometers parallel to the strike of the thrust front fed by transverse alluvial fans (DeCelles and Cavazza, 1999;

Sinha et al., 2009). The Amazonian foreland basin (Figure 1B) also contains several axial rivers that are fed by networks of transverse-oriented megafans draining the adjacent Andean thrust belt (Räsänen et al., 1992; Horton and DeCelles, 2001).

Although axial river systems are significant features in modern foreland basins, studies of ancient fluvial architecture tend to focus on transverse drainages and their relationship to down-dip (eustatic) and up-dip (tectonic) controls on sedimentation (Alexander and Leeder, 1987; Posamentier and Allen, 1993). Hartley et al. (2010) and Weissmann et al. (2010, 2011) have proposed that transverse-oriented distributive fluvial systems (DFSs) disperse sediment in radial, aggradational wedges originating at point sources along the basin margin, and are responsible for the deposition of most fluvial sediments preserved in the ancient record. Because DFSs are predicted to deposit the majority of preserved fluvial sediments, axial river systems are presumed to have low preservation potential and are most likely to develop in degradational settings or small areas within a basin (Weissmann et al., 2010).

However, new detrital zircon geochronologic data from this study imply a pervasive axial fluvial system was preserved in the Cordilleran foreland basin of southern Utah during Late Cretaceous time. Approximately nine million years of axial fluvial and alluvial deposits are exposed in the Straight Cliffs Formation throughout the Kaiparowits Plateau (Figure 2), enabling the controls on axial fluvial architecture to be studied in detail.

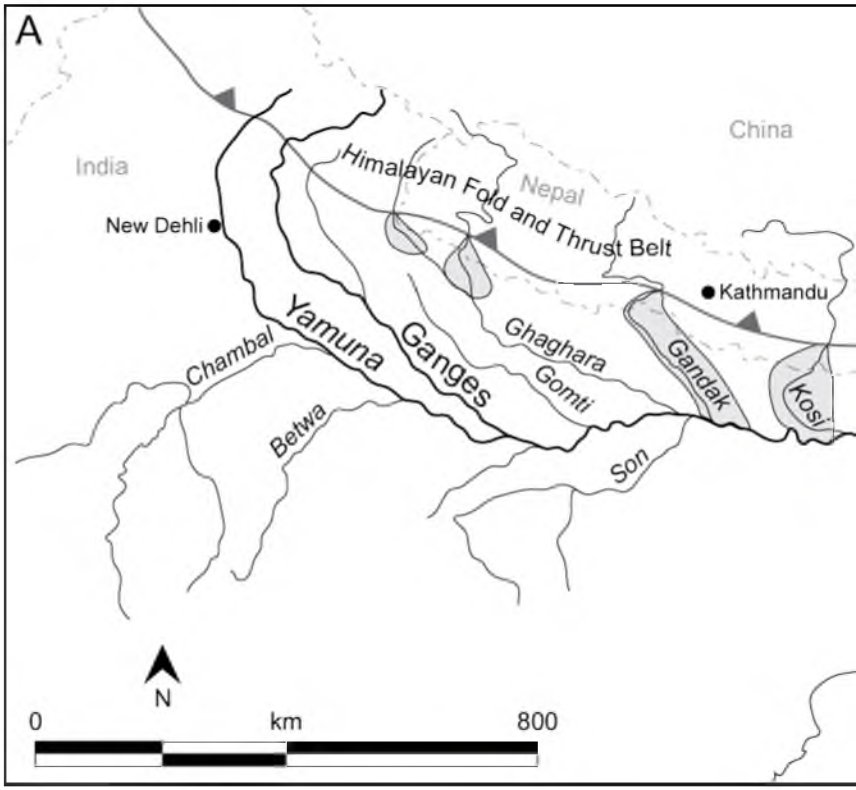
To date, most studies of Cordilleran foreland basin architecture have focused on transverse DFS deposits (Lawton, 1983, 1986; Fillmore, 1989, 1991; Goldstrand, 1994; Olsen et al., 1995; Horton et al., 2004; DeCelles et al., 1995; DeCelles and Cavazza,

1999; DeCelles, 2004; Edwards et al., 2005; May et al., 2013). Widespread exposures of Upper Cretaceous foreland basin strata record transverse fluvial and alluvial fan deposition adjacent to the Sevier fold-thrust belt, a prominent topographic high positioned along the basin margin (Armstrong, 1968; Lawton, 1983, 1986; Dickinson et al., 1986; DeCelles, 1994; DeCelles et al., 1995; Currie, 2002; Lawton et al., 2003; Edwards et al., 2005; May et al., 2013). Studies of Sevier foreland fluvial deposits link stratigraphic architecture with relative sea level change (Olsen et al., 1995; Van Wagoner, 1995), climate (Drummond et al., 1996), autogenic patterns (Hajek et al., 2011), and tectonic subsidence associated with Sevier thrust belt development (Robinson and Slingerland, 1998; Horton et al., 2004; Edwards et al., 2005). During periods of reduced accommodation in the foredeep region (tied to episodes of thrust belt propagation and climate-driven influxes of sediment), transverse rivers prograde into the basin and displace the axial systems basinward (Lawton et al., 2003; Schellenbach, 2013).

The factors governing axial fluvial architecture have remained largely unstudied in Cordilleran foreland strata, but detrital zircon geochronologic data from the Turonian-Campanian Straight Cliffs Formation help elucidate the relationship between source rocks and basin sedimentation. Previous studies of the Straight Cliffs Formation (Peterson, 1969a, 1969b; Shanley and McCabe, 1991, 1993, 1995; Hettinger, 1995, 2000; Allen and Johnson, 2010, 2011; Gallin et al., 2010; Gooley, 2010; Dooling, 2012; Pettinga, 2012) provide a necessary framework (Figure 3) to relate the driving forces behind fluvial and shallow marine architecture with the sedimentary source terranes adjacent to the Cordilleran foreland basin. With strong facies control across the

Kaiparowits Plateau, it is possible to identify variability in sediment sources and delivery within distinct stratigraphic intervals and depositional environments. Additionally, changes in provenance through time can be related to tectonic processes in both the Sevier and Maria thrust belts, which heavily influenced the evolution of fluvial systems in the basin.

Figure 1 – Examples of modern foreland basin drainage networks composed of axial and transverse drainages. (A) Himalayan foreland basin in India, with transverse rivers (thin black lines) and megafans (gray polygons) feeding the Ganges and Yamuna axial rivers (thick black lines). Modified from DeCelles and Cavazza (1999). (B) Andean foreland basin in South America. The Paraguay axial river is fed by transverse rivers and megafans draining the Andean fold-thrust belt. Other transverse rivers (Parapeti) bifurcate in swamp lands or shift toward an axial orientation (Grande). Modified from Horton and DeCelles (2001).


A
India
China
Nepal
New Dehli
Himalayan Fold and Thrust Belt
Kathmandu
Yamuna
Ganges
Ghaghara
Gomti
Gandak
Kosi
Chambal
Betwa
Son
N
0
km
800

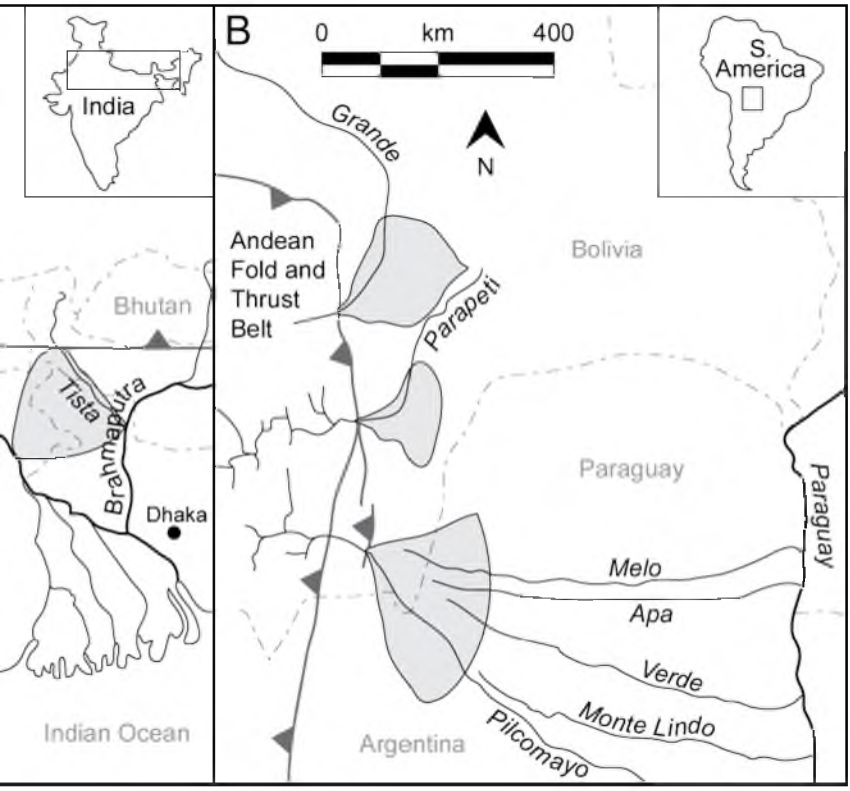

B
0
km
400
N
India
S.
America
Grande
Andean
Fold and
Thrust
Belt
Parapeti
Bolivia
Bhutan
Tista
Brahmaputra
Dhaka
Paraguay
Paraguay
Melo
Apa
Verde
Monte Lindo
Pilcomayo
Indian Ocean
Argentina

Figure 2 – Map of the Kaiparowits Plateau in southern Utah. Shaded regions represent present day exposures of the Straight Cliffs Formation. Black circles indicate locations where detrital zircon samples, paleocurrents, and/or petrographic samples were collected. Heward Creek is located on the eastern edge of the Paunsaugunt Plateau.

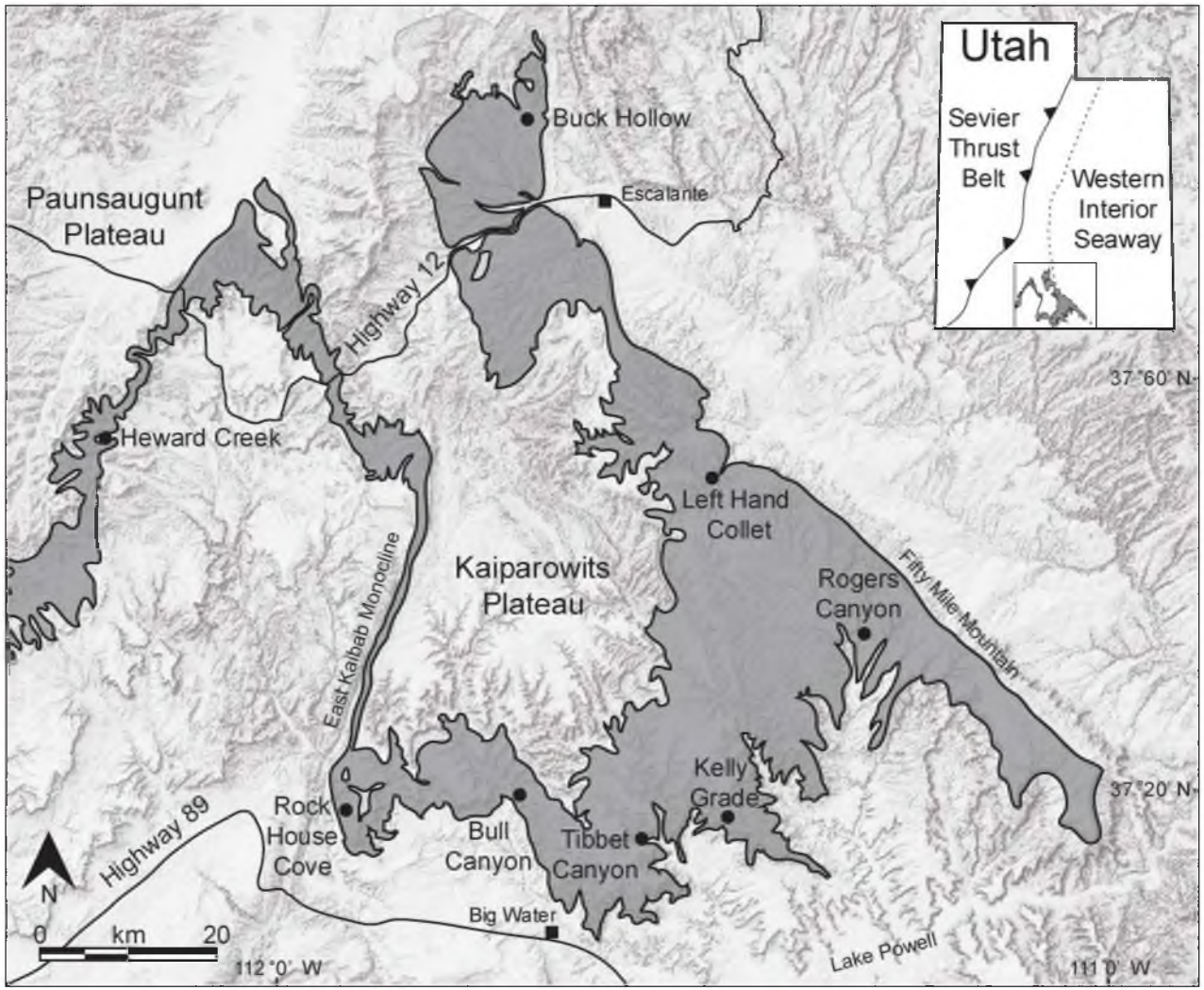
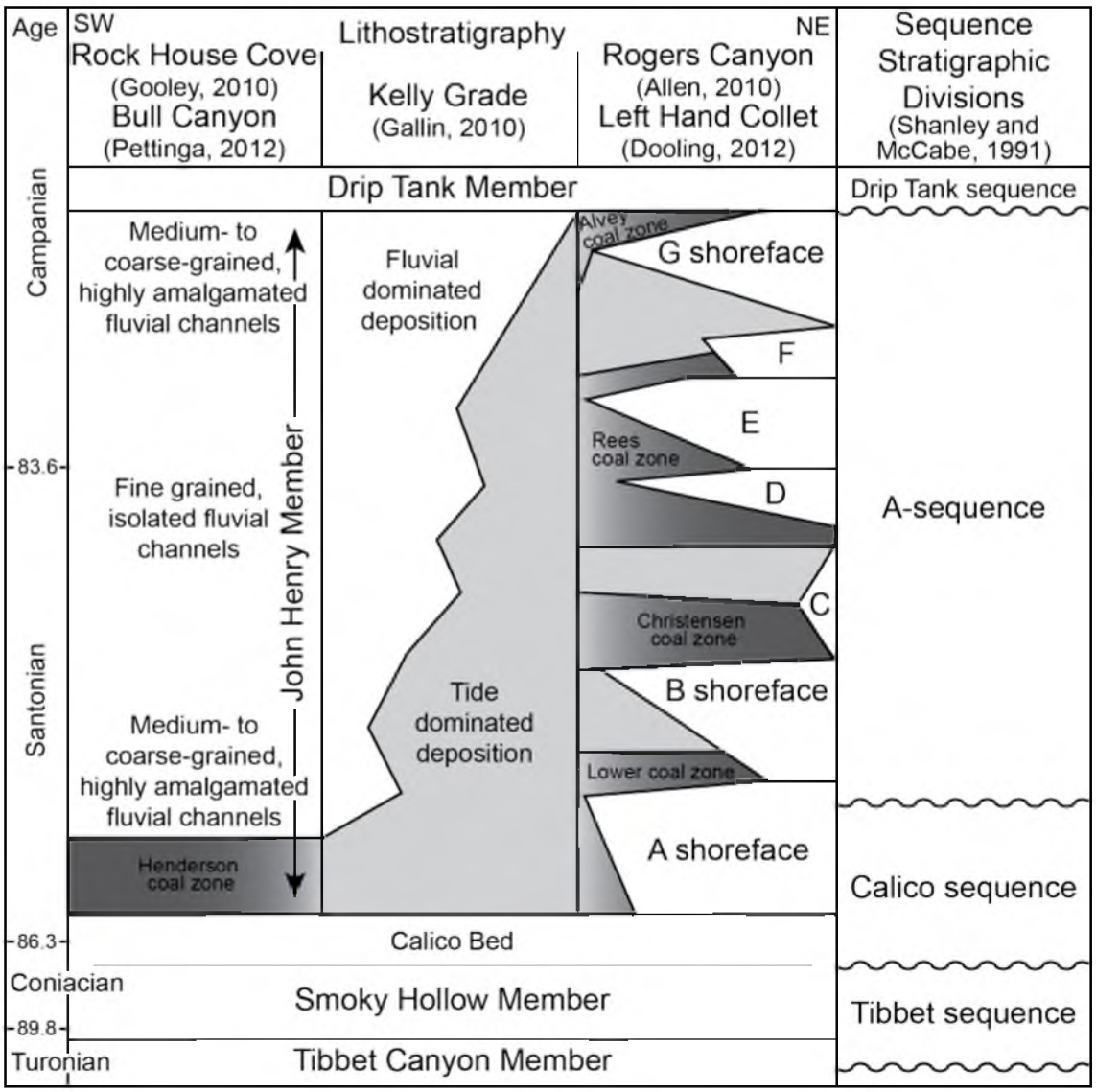

Utah
Sevier Thrust Belt
Western Interior Seaway
Buck Hollow
Escalante
Paunsaugunt Plateau
Highway 12
Heward Creek
Left Hand Collet
Kaiparowits Plateau
East Kaibab Monocline
Fifty Mile Mountain
Rogers Canyon
Kelly Grade
Rock House Cove
Bull Canyon
Tibbet Canyon
Highway 89
Big Water
Lake Powell
N
0 km 20
112 °0' W
111 °0' W
37 °60' N
37 °20' N

Figure 3 – Regional stratigraphic framework of the Straight Cliffs Formation depicting the southwest-northeast transition from fluvial deposition (Rock House Cove and Bull Canyon) to tidal, estuarine (Kelly Grade) and shallow marine deposition (Rogers Canyon and Left Hand Collet). Stratigraphic members and shoreface notation presented from Peterson (1969). Modified from Hettinger (1995).


Age
SW
Rock House Cove
(Gooley, 2010)
Bull Canyon
(Pettinga, 2012)
Lithostratigraphy
Kelly Grade
(Gallin, 2010)
NE
Rogers Canyon
(Allen, 2010)
Left Hand Collet
(Dooling, 2012)
Sequence Stratigraphic Divisions
(Shanley and McCabe, 1991)
Drip Tank Member
Drip Tank sequence
Campanian
Medium- to coarse-grained, highly amalgamated fluvial channels
Fluvial dominated deposition
Alvey coal zone
G shoreface
F
E
Rees coal zone
D
83.6
Fine grained, isolated fluvial channels
John Henry Member
A-sequence
C
Christensen coal zone
B shoreface
Santonian
Tide dominated deposition
Medium- to coarse-grained, highly amalgamated fluvial channels
Lower coal zone
A shoreface
Henderson coal zone
Calico sequence
86.3
Calico Bed
Coniacian
Smoky Hollow Member
Tibbet sequence
89.8
Turonian
Tibbet Canyon Member

REGIONAL GEOLOGY

Straight Cliffs Formation

The Straight Cliffs Formation is well exposed throughout the Kaiparowits Plateau, located in the Grand Staircase-Escalante National Monument of south-central Utah (Figure 2). Approximately 300-500 meters of Turonian-Campanian siliciclastic sedimentary deposits are exposed throughout the Kaiparowits Plateau, providing a nearly complete record of the marginal marine environment present during the initial retreat of the Western Interior Seaway. The earliest stratigraphic correlations of the Straight Cliffs Formation were performed by Peterson (1969a, 1969b). In doing so, he subdivided the formation into the Tibbet Canyon, Smoky Hollow, John Henry, and Drip Tank Members (Figure 3).

The lowermost Tibbet Canyon member (Figure 3) consists of ~20 meters of offshore and shoreface strata deposited along the margin of the Western Interior Seaway (Peterson, 1969b). The Tibbet Canyon Member marks the earliest transition from offshore mudstone and carbonate deposition to sandstone and siltstone deposition in south-central Utah. The Smoky Hollow Member is composed primarily of ~ 20-30 meters of isolated fluvial sandstone bodies interbedded with carbonaceous floodplain mudstones and thin coal seams (Peterson, 1969b). These fine- to coarse-grained terrestrial deposits represent a basinward shift of facies resulting from a regional drop in base level (Bobb, 1991; Shanley and McCabe, 1991). The top of the Smoky Hollow

Member is commonly distinguished by the presence of a coarse-grained, white and orange braided fluvial sandstone interval known as the Calico bed. This regionally extensive gravel sheet is composed of laterally and vertically amalgamated fluvial channels and records deposition during a period of decreased basin accommodation relative to sediment supply (Bobb, 1991). Shanley and McCabe (1991) proposed a sequence stratigraphic boundary at the base of the Calico bed, where a regionally extensive, erosive contact marks a drop in relative sea level.

The John Henry Member is the thickest (200-500 meters) and most laterally variable of the four members (Figure 3). The base of the John Henry Member is marked by a landward shift in facies recording a transgression that occurred after deposition of the Smoky Hollow Member. In the southern and western Kaiparowits Plateau, the John Henry Member consists primarily of multistory and single-story fluvial channel belts interbedded with carbonaceous floodplain mudstones and coals (Gooley, 2010; Pettinga, 2012) (Figure 3). In these areas, basal John Henry strata contain evidence for tidally influenced deposition (Shanley et al., 1992; Hettinger, 1995). Easternmost exposures of the John Henry Member consist of offshore through intertidal facies and the represent the latest episode of Western Interior Seaway deposition in southern Utah. Peterson (1969b) subdivided marine exposures of the John Henry Member into seven shoreface units (A-G) that were subsequently used by Allen and Johnson (2010, 2011) and Dooling (2012) when documenting stratigraphic architecture in the eastern Kaiparowits Plateau (Figure 3).

The uppermost Drip Tank Member consists of 30-100 meters of coarse-grained fluvial sandstones and channel lag conglomerates. The Drip Tank gradationally overlies

the John Henry Member and records a basinward shift in facies. Shanley and McCabe (1991) proposed a sequence boundary at the base of the Drip Tank Member (Figure 3), but more recent studies have suggested that the sequence boundary lies near the middle of the Drip Tank Member (Lawton et al., 2003; Schellenbach, 2013) Channel bodies in the Drip Tank are both vertically and laterally amalgamated, and floodplain deposits are rare.

Stratigraphic Architectural Trends

Gooley (2010) and Pettinga (2012) investigated fluvial strata from the Straight Cliffs Formation (at Rock House Cove and Bull Canyon, respectively) to identify possible controls on alluvial architecture (Figure 2). These studies documented trends in average channel widths, grain size, net-to-gross, channel clustering, channel stacking, and paleoflow direction throughout the Kaiparowits Plateau (Figure 4). Fluvial strata near the base of the Straight Cliffs Formation (Smoky Hollow Member and lower John Henry Member) provide evidence for northeast-directed paleoflow and show an upsection decrease in average grain size with a reduction in channel widths, lateral and vertical channel amalgamation, and net-to-gross ratio. The middle John Henry Member consists of laterally restricted channel belts with abundant coals and floodplain mudstones. The upper John Henry Member and Drip Tank Member document a reversed trend of increasing grain size with wider channels, more amalgamation of channel belts, and higher net-to-gross. The capping strata in the Drip Tank Member consist of a braided fluvial gravel sheet with paleocurrent measurements showing a preference for more easterly flow.

Recent studies have also focused on the stratigraphic architecture of shallow and intertidal deposits from the Straight Cliffs Formation (Gallin, 2010; Allen and Johnson, 2010, 2011; Dooling, 2012). Elements of shallow marine architecture include patterns of shoreline stacking patterns (progradational A and B shorefaces, retrogradational C, D and E shorefaces, and progradational/retrogradational F and G shorefaces), transgressive and regressive facies associations, and the distribution of paralic, intertidal, deltaic, and lagoonal facies adjacent to the shoreline (Figure 4). In addition to tectonic controls, shallow marine and intertidal stratigraphic architecture is closely tied with sediment supply, longshore currents, and eustacy, making it difficult to isolate the effects of subsidence rates on marginal marine sedimentation (Dooling, 2012). Nevertheless, data from shallow marine and intertidal strata provide insight into the sedimentary processes landward and along strike of the shoreline throughout the foreland basin.

Regional Sediment Source Areas

The Straight Cliffs Formation records marginal marine deposition adjacent to several prominent paleogeographic features during Turonian-Campanian time. A major source area for these depositional systems is presumed to be the Sevier fold-thrust belt, a northeast-trending mountain chain situated at the easternmost extent of the Cordilleran hinterland (DeCelles, 2004) (Figure 5). Approximately 300 kilometers south of the Kaiparowits Plateau was the Mogollon highlands, an east-trending topographic high in central Arizona and New Mexico (Bilodeau, 1986) that was uplifted during by tectonic activity in the Maria thrust belt (Salem, 2009). West of these mountain belts was the

Cordilleran volcanic arc, an active chain of subduction-related volcanism spanning the western margin of the North American plate (Barth and Wooden, 2006).

Sevier Fold-Thrust Belt

Late Cretaceous subduction of the Farallon plate beneath the western margin of the North American plate induced east-west crustal shortening through most of present day Nevada and western Utah (Burchfiel and Davis, 1972, 1975). More than 300 kilometers of shortening was accommodated by large-offset (>100 kilometers) thrust faults in the Sevier fold-thrust belt (DeCelles and Coogan, 2006). The easternmost extent of the Sevier fold-thrust belt during Turonian-Campanian time was located approximately 100 kilometers west of the Kaiparowits Plateau (Figure 5) (DeCelles et al., 1995; DeCelles, 2004). During this time, thin-skinned deformation and erosion of the Paxton, Pavant, and Canyon Range thrust sheets in central Utah and the Blue Mountain, Wah Wah, and Keystone thrusts in southern Utah and Nevada (Figure 5) exposed Proterozoic through Mesozoic sedimentary and metasedimentary units throughout the Sevier thrust belt (Miller, 1966; Armstrong, 1968; DeCelles and Coogan, 2006).

Mogollon Highlands

Additional topography was present along the southern margin of the Cordilleran foreland basin in the Mogollon highlands. Initial uplift of the region was triggered by Early Cretaceous rifting in southeastern Arizona and New Mexico, which formed a northwest-trending topographic high in central Arizona known as the Mogollon highlands (Figure 5) (Bilodeau, 1986). Northeastward tilting and uplift of early Mesozoic and

Paleozoic strata adjacent to the rift basin served as the southwestern margin to the Cordilleran foreland basin. During Early Cretaceous time, Mesozoic and Paleozoic sedimentary rocks exposed in the Mogollon highlands were eroded and transported southwest into the Bisbee and McCoy basins and northeast into the Cordilleran foreland basin (Bilodeau and Lindberg, 1983; Bilodeau, 1986). The onset of sea level rise during the Early Cretaceous and subsequent deposition of marine strata unconformably over the northernmost Mogollon Highlands prevented further erosion of these Mesozoic and Paleozoic rocks in northern Arizona and southern Utah.

Between latest Turonian and Coniacian time, development of the east-west trending Maria fold-thrust belt in central Arizona (Figure 5) (Knapp and Heizler, 1987; Spencer and Reynolds, 1990; Salem, 2009) subjected the Mogollon highlands to an additional episode of exhumation. Thick-skinned deformation and localized north-south crustal shortening resulted in the exhumation of Mesozoic and Paleozoic strata, ultimately exposing 1.3-1.9 Ga Yavapai-Mazatzal basement rock in central Arizona (Wasserburg and Lanphere, 1965; Ferguson et al., 2004; Spencer and Pecha, 2012). The southern margin of the Maria fold-thrust belt contained remnant exposures of Triassic and Jurassic volcanic and magmatic bodies associated with subduction of the Farallon plate and Bisbee rifting (Spencer et al., 2011). This paleotopographic high supplied sediment to the McCoy basin in southern Arizona (Harding and Coney, 1985; Barth et al., 2004; Spencer et al., 2011) and the Cordilleran foreland basin north of the Maria fold-thrust belt (Lawton et al., 2003; Laskowski et al., 2013; Schellenbach, 2013).

Cordilleran Volcanic Arc

Subduction–related magmatism along the Cordilleran volcanic arc between 250 and 81 million years ago (Chen and Moore, 1982; Barth and Wooden, 2006) led to the development of an additional topographic high along the western margin of the North American plate (Figure 5). Triassic through Cretaceous volcanic and plutonic detritus from southern California (Busby-Spera et al., 1990), Arizona (Busby-Spera, 1988) and central Nevada (Dickinson, 2006) accumulated in localized intra-arc and retro-arc basins, which were likely exposed to a network of drainages flowing northeast into the Cordilleran foreland basin. In addition to the reworked volcanic detritus, this drainage system also transported newly-erupted volcanic material from the Cordilleran arc into the foreland basin (Lawton et al., 2003; May et al., 2013; Schellenbach, 2013).

Figure 4 – Schematic cross section of the Straight Cliffs Formation through several study areas across the Kaiparowits Plateau. Spatial and temporal variations in fluvial, tidal, and shallow marine architecture are represented by changes in the intensity of channel amalgamation, shoreline trajectory, and distribution of paralic facies.

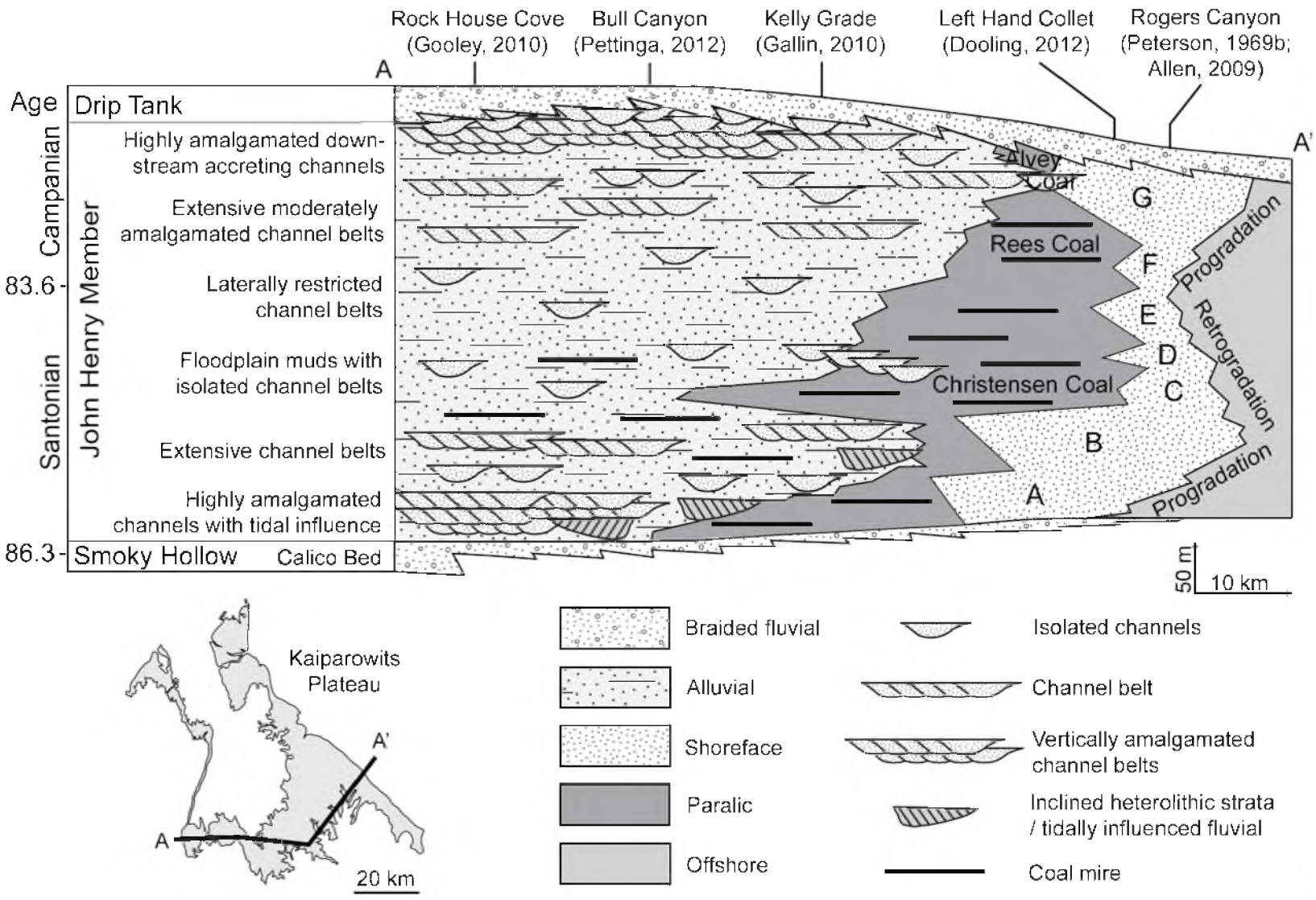
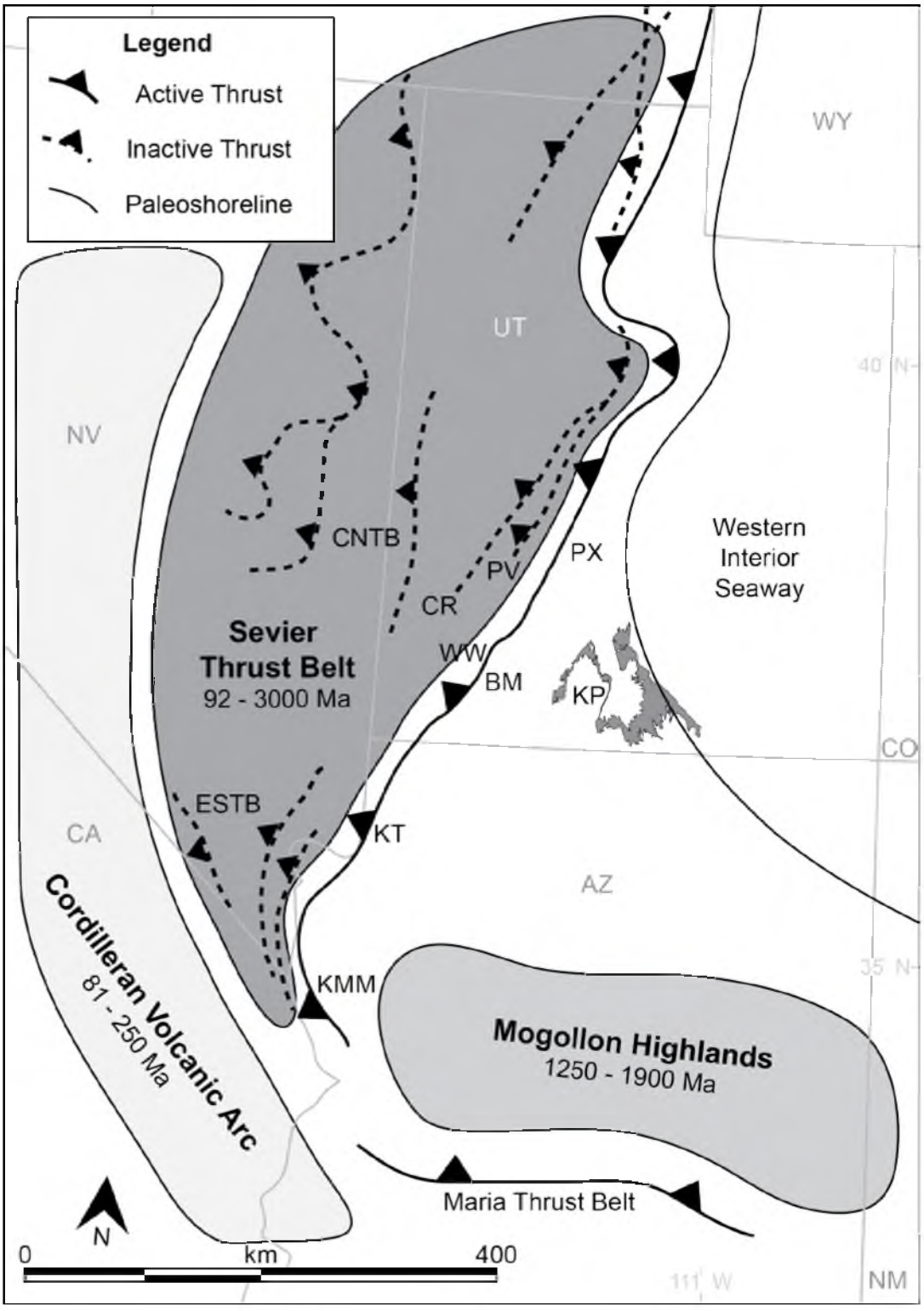

Rock House Cove (Gooley, 2010)
Bull Canyon (Pettinga, 2012)
Kelly Grade (Gallin, 2010)
Left Hand Collet (Dooling, 2012)
Rogers Canyon (Peterson, 1969b; Allen, 2009)
A
A'
Age
Drip Tank
Campanian
Santonian
John Henry Member
Highly amalgamated down-stream accreting channels
Extensive moderately amalgamated channel belts
Laterally restricted channel belts
Floodplain muds with isolated channel belts
Extensive channel belts
Highly amalgamated channels with tidal influence
83.6
86.3
Smoky Hollow
Calico Bed
Alvey Coal
Rees Coal
Christensen Coal
G
F
E
D
C
B
A
Progradation
Retrogradation
Progradation
50 m
10 km
Kaiparowits Plateau
A
A'
20 km
Braided fluvial
Alluvial
Shoreface
Paralic
Offshore
Isolated channels
Channel belt
Vertically amalgamated channel belts
Inclined heterolithic strata / tidally influenced fluvial
Coal mire

Figure 5 – Paleoreconstruction of southwestern North America during Coniacian-Santonian time (after DeCelles, 2004). The Kaiparowits Plateau (KP) was situated between the Sevier thrust belt to the west and the shoreline of the Western Interior Seaway to the east. The Maria thrust belt was actively uplifting the Mogollon highlands in central Arizona. The Cordilleran volcanic arc extended from southern Arizona, through California, and continued north along the continental margin. Primary detrital zircon ages associated with each source terrane are labeled in shaded regions. For more specific age data, see Figures 14 and 16. Age data compiled from Chen and Moore (1982), Gerber et al. (1995), Coleman and Glazner (1997), Ferguson et al. (2004), Barth and Wooden (2006), Amato et al. (2008), Dickinson and Gehrels (2009), Lawton et al. (2010), and Spencer and Pecha (2012). Abbreviations – BM: Blue Mountain thrust; CNTB: Central Nevada thrust belt; CR: Canyon Range thrust; ESTB: Eastern Sierra thrust belt; KMM: Keaney / Mollusk Mine thrust; KT: Keystone thrust; PV: Pavant thrust; PX: Paxton thrust; WW: Wah Wah thrust.


Legend
Active Thrust
Inactive Thrust
Paleoshoreline
WY
UT
NV
CNTB
PV
PX
CR
Western
Interior
Seaway
Sevier
Thrust Belt
92 - 3000 Ma
WW
BM
KP
CO
ESTB
KT
CA
AZ
Cordilleran Volcanic Arc
81 - 250 Ma
KMM
Mogollon Highlands
1250 - 1900 Ma
Maria Thrust Belt
N
0
km
400
NM

METHODOLOGY

This study focuses on detrital zircon U-Pb geochronologic data from 40 sandstone samples collected from five locations throughout southern Utah (Heward Creek, Bull Canyon, Kelly Grade, Left Hand Collet, and Buck Hollow) (Figure 2, 6; Table 1). At each location, sandstones were sampled from representative facies in each of the stratigraphic members exposed in the section. Heward Creek (in the easternmost Paunsaugunt Plateau) and Bull Canyon (southwestern Kaiparowits Plateau) are located in western exposures of the Straight Cliffs Formation and are composed of fluvial and tidally influenced channel deposits in an axial fluvial system. Samples collected from Kelly Grade primarily consist of tidal channels and tidal bar forms deposited on the ancient coastal plain. Left Hand Collet and Buck Hollow are positioned at the Coniacian-Campanian shoreline and detrital zircon samples were derived from shoreface and tidal channel sandstones (Table 1).

In addition to the use of detrital zircons, paleocurrent measurements, sandstone modal analyses, and clast counts were implemented to infer sedimentary provenance. Paleocurrent measurements were obtained from trough cross-stratified fluvial sandstones, planar cross-stratified accretion sets, laterally and longitudinally accreting bar forms, ripples, and flute casts. Sandstone petrography samples were point counted to obtain relative proportions of quartz (Qm + Qp), feldspar, and lithic fragments using a modified Gazzi-Dickinson methodology (Ingersoll et al., 1984; Dickinson, 1985; Zuffa, 1985).

Detrital Zircon U – Pb Geochronology

A total of 40 detrital zircon samples were collected from the Straight Cliffs Formation in the Kaiparowits Plateau. Each sample was carefully collected from outcrop faces that were in place, free of significant diagenetic alteration, and clear of soil and loose sand that could contaminate the samples. Ten to 15 kilograms of fine- to medium-grained sandstone were collected for each sample. Zircons were isolated through use of a Wilfley table, Frantz magnetic separator, and density separation using methylene iodide. Several hundred zircons from each sample were carefully mounted in a 25 millimeter epoxy plug prior to geochronologic analysis. Care was taken to avoid biasing grains based on their color, size, and shape when mounting. Each mount was imaged using cathodoluminescence to identify zoning within the crystal lattice of each zircon. Zonation within zircons is created during successive episodes of crystallization, and geochronologic analyses that target multiple zones can yield erroneous ages (Koschek, 1993).

One-hundred and twenty zircons from each sample were randomly selected for U-Pb geochronologic analysis using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Analyses were conducted at the University of New Brunswick in Fredericton, New Brunswick, Canada, using an Agilent 7700x series quadrupole mass spectrometer. A 26 μm hole was ablated in each grain using a Resonetics S-155-LR 193nm Excimer laser, and care was taken to ensure multiple zones, cracks, and inclusions were not targeted during laser ablation. Each analysis was conducted for 25 seconds, followed by a 20 second hiatus allowing the instrument to return to background conditions.

The elements ^{238}U, ^{232}Th, ^{208}Pb, ^{207}Pb, ^{206}Pb, and ^{204}Pb were measured in counts per second during each 25 second analysis. To ensure data reliability, several standards were analyzed after every 8 zircons were analyzed. The standards included Plesovice zircons from the Bohemian Massif (Slâma et al., 2008), 91500 zircons (Wiedenbeck, 1995), and a standard trace element glass (SRM 610) from the National Institute of Standards and Technology (Pearce et al., 1997).

The raw isotope data were processed using Iolite (Paton et al., 2011) and VisualAge (Petrus and Kamber, 2012) software packages, which convert isotope ratios to ages and apply fractionation corrections using data from standard grains. Ages younger than 500 Ma were calculated using the $^{206}Pb/^{238}U$ ratio, whereas ages older than 500 Ma were calculated using the $^{207}Pb/^{206}Pb$ ratio. Ages that were greater than 10% discordant were discarded. Common ^{204}Pb corrections were applied to discordant zircons with $^{206}Pb/^{204}Pb$ values less than the average ratio measured for the standard grains. The ^{204}Pb corrected ages were calculated using the Andersen method (Andersen, 2002), which does not rely on measured ^{204}Pb values and does not assume the corrected U-Pb ratios are concordant. The reported uncertainty for Andersen corrected ages is generally smaller than other common ^{204}Pb corrections because the correction is able to account for Pb loss throughout the life of the zircon crystal.

Zircon ages from any pair of samples can be compared using the Kolomogorov-Smirnov (K-S) test, which assigns a p-value to sample pairs based on the similarity of their cumulative density functions (Press, 1986; Guynn and Gehrels, 2006). High p-values ($p > 0.05$) indicate a statistically significant likelihood that two samples may have been derived from sources with identical zircon age distributions. Low p-values ($p <$

0.05) suggest the samples were sourced by statistically distinguishable distributions of zircon ages. K-S tests were performed using a Microsoft Excel spreadsheet developed by the LaserChron Center at the University of Arizona (Guynn and Gehrels, 2006).

Figure 6 – Generalized measured sections from Heward Creek, Bull Canyon, Kelly Grade, Left Hand Collet, and Buck Hollow. Datum is the top Calico bed. Detrital zircon samples are indicated by a zircon and sample name. Vertical bars along left side of each generalized section correspond to fluvial (white), tidal (light gray) and marine (dark gray) environments. Abbreviations: TCM: Tibbet Canyon Member; SHM: Smoky Hollow Member; JHM: John Henry Member; DTM: Drip Tank Member.

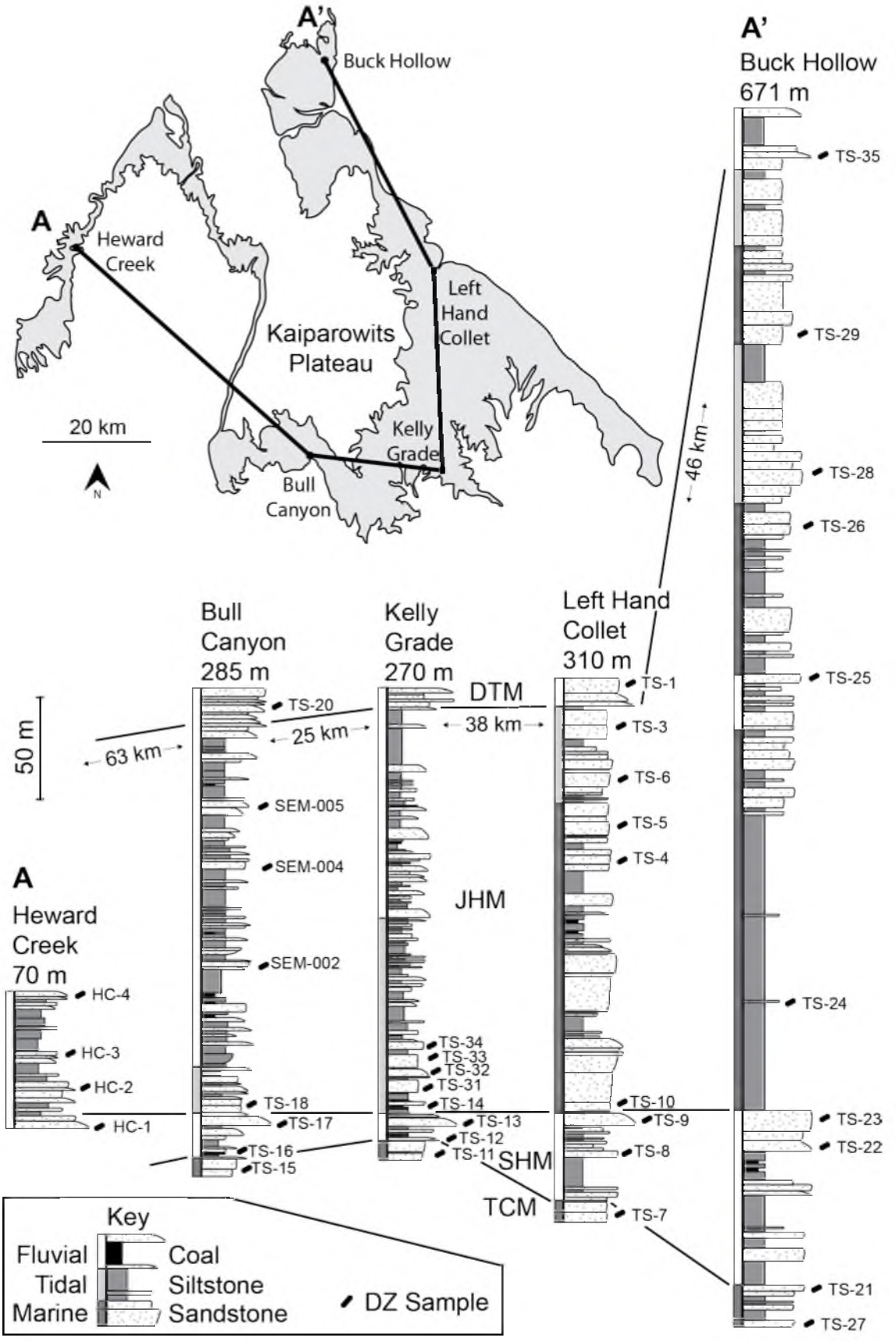

A'
Buck Hollow
A
Heward Creek
Kaiparowits Plateau
Left Hand Collet
Kelly Grade
Bull Canyon
20 km
N
A'
Buck Hollow
671 m
TS-35
TS-29
TS-28
TS-26
TS-25
TS-24
TS-23
TS-22
TS-21
TS-27
46 km
Bull Canyon
285 m
Kelly Grade
270 m
Left Hand Collet
310 m
DTM
38 km
25 km
63 km
50 m
TS-20
SEM-005
SEM-004
SEM-002
TS-18
TS-17
TS-16
TS-15
TS-34
TS-33
TS-32
TS-31
TS-14
TS-13
TS-12
TS-11
JHM
SHM
TCM
TS-1
TS-3
TS-6
TS-5
TS-4
TS-10
TS-9
TS-8
TS-7
A
Heward Creek
70 m
HC-4
HC-3
HC-2
HC-1
Key
Fluvial
Tidal
Marine
Coal
Siltstone
Sandstone
DZ Sample

Table 1
Detrital zircon sample facies and locations

Facies	Heward Creek	Bull Canyon	Tibbet Canyon	Kelly Grade	Left Hand Collet	Buck Hollow	Total
Fluvial	4 (10%)	6 (15%)		1 (3%)	3 (8%)	5 (13%)	19 (47%)
Tidal		1 (3%)	1 (3%)	6 (15%)	2 (5%)	1 (3%)	11 (28%)
Marine		1 (3%)		1 (3%)	4 (10%)	4 (10%)	10 (25%)
Interval							
DTM		1 (3%)			1 (3%)	1 (3%)	3 (8%)
JHM	3 (8%)	4 (10%)	1 (3%)	5 (13%)	5 (13%)	5 (13%)	23 (57%)
Calico	1 (3%)	1 (3%)		1 (3%)	1 (3%)	2 (5%)	6 (15%)
SHM		1 (3%)		1 (3%)	1 (3%)	1 (3%)	4 (10%)
TCM		1 (3%)		1 (3%)	1 (3%)	1 (3%)	4 (10%)
Total	4 (10%)	8 (20%)	1 (3%)	8 (20%)	9 (23%)	10 (25%)	

RESULTS

Paleocurrent Measurements

Paleocurrent measurements (n=4568) and accretion set measurements (n=2040) are presented from fluvial strata at Rock House Cove, Bull Canyon, and Kelly Grade, as well as tidal, estuarine, and shoreface strata at Kelly Grade and Left Hand Collet (Figure 2, 7).

Fluvial Paleocurrents

Paleocurrent measurements in fluvial strata from Rock House Cove (n=1577) were obtained from trough cross-stratified sandstones, planar cross-stratification, and ripple cross-lamination (Gooley, 2010). Accretion sets were measured from laterally and longitudinally accreting bar forms. Near the base of the John Henry Member, the average paleoflow direction trends northeast, and accretion sets are oriented obliquely toward the north. Middle John Henry strata record a shift toward southeasterly flow with laterally accreting bar forms advancing south and east. Paleocurrent data from the upper John Henry Member imply flow resumed its northeast trajectory, this time with a predominance of longitudinally accreting bar forms instead of the lateral accretion common in lower John Henry Member strata.

At Bull Canyon, paleocurrent data (n=1869, Figure 7) generally indicate northeasterly flow and consist of trough cross-stratified sandstones, planar cross-

stratification, laterally and longitudinally accreting bar forms, imbricated mud clasts, and ripple cross-lamination (Pettinga, 2012). At the base of the John Henry Member, mean paleoflow measurements are directed toward the northeast, and show a preference for downstream accretion toward the northeast. Data from the middle John Henry Member imply paleoflow was oriented toward the east with accretion sets primarily toward the northeast. In the Drip Tank Member, paleoflow was directed toward the southeast, and bar forms were accreting toward the northeast. This upsection trend is consistent with an overall shift in paleoflow from northeast to east.

At Kelly Grade, fluvial paleoflow measurements (n=1565, Figure 7) in the upper John Henry Member indicate paleoflow was directed toward the northeast and barforms accreting toward the north (Gallin, 2010). Measurements from the Drip Tank Member imply flow direction was oriented toward the east. Paleocurrent measurements at Kelly Grade show an upsection shift from northeast to east, which is similar to transition observed at Bull Canyon.

Tidal and Marine Paleocurrents

Tidal paleocurrent indicators from Kelly Grade (n=929) are generally oriented toward the northeast and consist of trough and planar cross stratification, herringbone cross-stratification, ripple cross-lamination, and both laterally and longitudinally accreting bar forms (Gallin, 2010). Tidal strata in the lower John Henry contain mostly unidirectional indicators oriented toward the north and accretion sets directed toward the east. Tidal paleocurrent indicators from the middle John Henry Member imply bi-

directional flow was directed toward the east and west with accretion sets advancing eastward.

Paleocurrent data from Left Hand Collet (n=668, Figure 7) were measured from trough and planar cross-stratified sandstones, ripple cross-laminations, herringbone cross-stratification, and accretionary bar forms (Dooling, 2012). In many cases, marine paleocurrents from Left Hand Collet show evidence of tidal influence, which might overprint the marine paleocurrent indicators. Measurements from the lowermost A and B progradational shoreface successions show primarily northeasterly flow with southeastward accretion sets. Retrogradational shoreface successions (C, D, E) show evidence for southeasterly flow with accretion sets advancing to the northeast (C), southeast (D), and southwest (E). Uppermost shoreface successions indicate flow toward the northeast (F) and accretion toward the east (F and G).

Sandstone Petrology

Sandstone modal analyses were conducted for 122 samples from all members of the Straight Cliffs Formation across the Kaiparowits Plateau (Table 2) (Allen and Johnson, 2010; Gallin, 2010; Gooley, 2010; Pettinga, 2012; this study). A minimum of 500 grains from each sample were identified using a modified version of the Gazzi-Dickinson point counting method (Ingersoll et al., 1984; Dickinson, 1985; Zuffa, 1985). Petrographic data from each location (Rock House Cove, Bull Canyon, Kelly Grade, Left Hand Collet, and Rogers Canyon) are plotted on traditional QtFLu ternary diagrams (Figure 8). The end-members on each ternary diagram represent total quartz, feldspar, and unstable lithics (Dickinson, 1985).

Using the relative proportions of total quartz, feldspar, and unstable lithics as a metric, Dickinson (1985) subdivided the QtFLu plots into seven categories representing various types of sedimentary source terranes. Sandstone compositional data from all Straight Cliffs Formation samples plot in the recycled orogen, craton interior, and transitional continental provenance categories (Figure 8), implying sediment derivation from primarily thrust belt and recycled sedimentary sources (Dickinson, 1985). Fluvial samples from the western and southern Kaiparowits Plateau (Rock House Cove, Bull Canyon, and Kelly Grade, Figure 2) cluster near the boundary between recycled orogen and transitional continental, with several points located in the craton interior category. This distribution implies recycled sedimentary strata were a likely source for these samples, as well as exposures of granitic and gneissic cratonic rocks. The relatively high quartz content with subordinate amounts of feldspar and lithic fragments implies volcanic arc sources and basement block uplifts were not major contributors of sediment to the foreland basin. Lithic fragments predominantly consist of chert and sedimentary lithics, with subordinate amounts of micaceous material. The ratio of monocrystalline quartz to polycrystalline quartz for fluvial sands averages 40, which is characteristic of interior cratonic sources (Dickinson, 1985). Marine samples from the Tibbet Canyon Member (Bull Canyon, Kelly Grade, and Left Hand Collet) and John Henry Member (Left Hand Collet and Rogers Canyon, Figure 2) cluster in the recycled orogen category but generally contain smaller proportions of feldspar than fluvial samples, implying recycled sedimentary rocks were a more significant source terrane for marine strata than fluvial strata (Allen and Johnson, 2010).

Figure 9 shows temporal trends in sandstone modal compositions. Generally, samples document an upsection increase in total quartz from the Tibbet Canyon Member through the Calico bed at the top of the Smoky Hollow Member. The transition into the John Henry Member records a decrease in total quartz with an increase in feldspar. At Rock House Cove, Bull Canyon, and Kelly Grade, total quartz decreases upsection through lower and middle John Henry strata, and then increases through the upper John Henry and Drip Tank Members. In contrast, the proportion of unstable lithics increases through the lower and middle John Henry Member and decreases through the remainder of the formation. The proportion of feldspar remains relatively consistent through the John Henry Member but decreases in the Drip Tank Member. At Left Hand Collet and Rogers Canyon, the John Henry Member records an upsection decrease in total quartz with an increase in unstable lithics. Feldspar content at Left Hand Collet decreases upsection, but remains relatively consistent at Rogers Canyon.

The upsection trends noted in fluvial samples indicate cratonic and transitional continental detritus is more prominent in Smoky Hollow and lower John Henry samples (high Qt, mid F, mid Lu), whereas upper John Henry and Drip Tank strata contain an increased abundance of recycled orogenic detritus (high Qt, low F, low Lu). In marine samples, the upsection trends are less apparent but signal a minor increase in cratonic-derived feldspars and lithic fragments through time. This can be attributed to an increase in fluvial influence at the shoreline as fluvial facies prograded eastward through time.

Clast Counts

Clast count data (N=8, n=1025) were collected from channel lag deposits in the Calico bed at Kelly Grade, Buck Hollow, and Main Canyon (Fig. 2). Clasts were also collected from the A shoreface at Main Canyon. Braided fluvial strata of the Calico bed contain well-rounded pebbles of chert (81% of clasts), quartzite (16%), and sandstone (3%). These proportions are consistent across the Kaiparowits Plateau and do not show any significant spatial trends. Clasts from the A shoreface show a significant decrease in chert (56%), with an increase in quartzite (43%), and a minor decrease in sandstone (1%).

U – Pb Geochronology

Detrital zircon geochronologic data from the Straight Cliffs Formation (N=40 samples, n=3650 individual analyses, Table 1, Figure 6) are presented using age histograms superimposed on relative probability plots (Figure 10, 11). Data are also presented in Table 3 and Table 4. Fluvial detrital zircon samples (N=19) were predominantly derived from the John Henry Member at Bull Canyon and Heward Creek (Figure 2). Additional fluvial samples were collected from the Smoky Hollow and Drip Tank Members at Bull Canyon, Left Hand Collet, and Buck Hollow. Tidal samples (N=11) were collected from the John Henry Member at Bull Canyon, Kelly Grade, and Buck Hollow. Marine samples (N=10) were derived from the John Henry Member at Left Hand Collet and Buck Hollow. Additionally, marine samples were collected from the Tibbet Canyon Member at Bull Canyon, Kelly Grade, Left Hand Collet, and Buck Hollow. Detrital age spectra have been subdivided into four age populations (A-D). Each population may be linked with one or more potential source region exposed near the

Cordilleran foreland basin during Turonian-Campanian time. The characteristics of each age population are outlined in this section, followed by a discussion of spatial and temporal trends observed in the dataset.

Population A: Mesozoic Ages (81 – 250 Ma)

Mesozoic ages account for 13% of all Straight Cliffs ages (Figure 10) and have major peaks at 96 Ma, 147 Ma, and 225 Ma (Figure 12). Mesozoic ages are present in all samples, and range from 1% of ages in marine strata at Kelly Grade (TS-11, Figure 11) to 43% of ages in fluvial strata at Buck Hollow (TS-25, Figure 11).

Zircons comprising Population A were ultimately derived from volcanic sources in the Cordilleran volcanic arc in southwestern Arizona and southern California (Figure 5), which was active between 81 and 250 Ma (Chen and Moore, 1982; Barth and Wooden, 2006). Turonian-Campanian zircons comprise only 7% of the total Mesozoic arc-derived population. The majority of Mesozoic zircons originating from the volcanic arc comprise 96 Ma, 147 Ma, and 225 Ma peaks, indicating many of these arc-derived zircons may have been immobilized and reworked prior to deposition in the Kaiparowits basin. Latest Jurassic ages in the 147 Ma peak were ultimately derived from 147 Ma dikes in the Mojave Desert region (Gerber et al., 1995), and the Late Cretaceous ages forming the 96 Ma peak were ultimately derived from the Sierra Nevada batholith (Coleman and Glazner, 1997). Zircons of these ages may have been derived directly from their corresponding intrusive bodies, but may also have been derived from proximal foreland basin deposits and wedge-top basins (e.g., Iron Springs Formation) that were uplifted and exhumed during episodes of thrust belt propagation (Goldstrand, 1994).

Mesozoic foreland basin strata containing arc-derived zircons are a likely source for the 225 Ma age peak (Figure 13) (Dickinson and Gehrels, 2009).

Population A zircons from each stratigraphic member show a distinct upsection decrease in the ages of the youngest grains present (Figure 14). The youngest concordant ages from each interval that overlap at 2σ can be used to estimate the maximum depositional age of the corresponding interval. The methodology described by Dickinson and Gehrels (2009) recommends using at least three grains to obtain a robust maximum depositional age for a given sample. The resultant maximum depositional ages with 95% confidence for each member are 91.8±2.9 Ma (Tibbet Canyon Member), 86.1±1.3 Ma (Smoky Hollow Member), 82.3±3.0 Ma (John Henry Member), and 81.3±0.6 (lower Drip Tank Member). In general, these ages are several million years younger than previous biostratigraphic estimates, which placed the Tibbet/Smoky Hollow contact roughly in the Turonian stage (index fossil *Prionocyclus hyatti*), and the John Henry/Drip Tank contact in late Santonian/earliest Campanian time (*Endocostea baltica* and *Sphenoceramus patootensiformis*) (Peterson, 1969; Cobban, 2000).

Population B: Paleozoic through Mesoproterozoic Ages (250 – 1250 Ma)

Paleozoic through Mesoproterozoic ages comprise 25% of all Straight Cliffs Formation zircons (Figure 10) and form a prominent Paleozoic peak (414 Ma) and Grenville peak (1076 Ma). Grains from Population B range from 4% of all grains in isolated fluvial channels in the middle John Henry Member at Bull Canyon (SEM-004) to

51% of all grains in marine strata of the Upper John Henry Member at Buck Hollow (TS-29).

Zircons representing Population B were primarily derived from sedimentary and metasedimentary units comprising the Sevier thrust belt (Figure 5, 14, 15) (Dickinson and Gehrels, 2009; Lawton et al., 2010). The Canyon Range, Pavant, Paxton, Blue Mountain, and Wah Wah thrust sheets in southern Utah (Figure 5) exposed Proterozoic through Mesozoic quartzites, siliclastics, and carbonates containing recycled zircons of Paleozoic and Precambrian age (Miller, 1963, 1966; Fillmore, 1989, 1991; Goldstrand, 1994; Dickinson and Gehrels, 2009; Lawton et al., 2010). Grenville ages (900-1250 Ma) are prominent in many units comprising the thrust belt (Dickinson and Gehrels, 2008a, 2008b, 2009; Lawton et al, 2010) and represent the recycling of Grenville orogenic detritus originally derived from eastern Laurentia. Additionally, Paleozoic and Neoproterozoic ages are common in the Sevier thrust belt and were ultimately derived from remnant volcanic arc sources in eastern Laurentia and Mexico (Dickinson and Gehrels, 2008b).

Subordinate grains from Population B may have been derived from patches of sedimentary cover throughout the Mogollon highlands. Prior to the onset of Early Cretaceous rifting in the Bisbee basin, the Mogollon highlands region consisted of relatively undeformed and laterally extensive Paleozoic and Mesozoic sedimentary deposits adjacent to exposures of Yavapai-Mazatzal basement rock (Bilodeau, 1986). During Early Cretaceous time, uplift and tilting of the Bisbee rift shoulder subjected the sedimentary rocks to erosion, but patches of remaining sedimentary cover blanketed parts of the Mogollon highlands during Late Cretaceous time. Triassic through Early

Cretaceous rocks in southern Utah and Arizona (Moenkopi, Chinle, Navajo, Morrison, Cedar Mountain, Burro Canyon Dakota Formations) contain zircons derived from the Yavapai-Mazatzal basement rocks, Grenville and Paleozoic magmatic bodies exposed in eastern Laurentia (Dickinson and Gehrels, 2008a, 2008b), and the Cordilleran volcanic arc (Bilodeau, 1986) (Figure 13).

Population C: Mesoproterozoic and Paleoproterozoic Ages (1.25 – 1.90 Ga)

Mesoproterozoic and Paleoproterozoic ages between 1.25 and 1.90 Ga represent 59% of all detrital zircons from the Straight Cliffs Formation (Figure 10). Ages in this population comprise two significant peaks. The more prominent age peak is centered at 1.68 Ga and contains 76% of zircons in this age population. A smaller peak centered at 1.40 Ga represents the remaining 24% of ages in this population. Compared to one another, the relative heights of the 1.40 and 1.68 Ga peaks vary among various samples, but there is no obvious pattern relating the heights of these peaks with relative positions in the Kaiparowits Plateau or specific time intervals in which the samples were deposited. The 1.68 Ga peak is present in 95% of Straight Cliffs samples, and is nearly absent in three distal samples (TS-25, TS-26, TS-29) from Buck Hollow (Figure 11). The 1.40 Ga peak is prominent in only 50% of all samples, most of which are fluvial samples.

Detrital zircons representing Population C are predominately derived from the Mogollon highlands in central Arizona (59% of all Straight Cliffs zircons) (Figure 5). The 1.6-1.8 and 1.4 Ga age peaks identified in most Straight Cliffs Formation samples are correlative with Yavapai-Mazatzal basement rocks in central Arizona (Wasserburg

and Lanphere, 1965; Lanphere, 1968; Anderson and Bender, 1989; Gleason et al., 1994; Hawkins et al., 1996; Spencer and Pecha, 2012). Activation of the Maria thrust belt during latest Turonian-Santonian time produced renewed topography in the Mogollon region (Knapp and Heizler, 1987; Spencer and Reynolds, 1990; Salem, 2009), exposing the Yavapai-Mazatzal intrusive bodies throughout central Arizona and New Mexico. The source of the 1.6-1.8 Ga zircons is an extensive metamorphosed magmatic belt that developed as a result of plate convergence during the Paleoproterozoic Mazatzal orogeny (Amato et al., 2008). The expansive distribution of this magmatic belt resulted in widespread exposures of 1.6-1.8 Ga throughout the Mogollon highlands.

The 1.4 Ga intrusions present in the Mogollon highlands were emplaced during a smaller orogenic event relative to the Mazatzal orogeny (Gleason et al., 1994; Nyman et al., 1994; Daniel et al., 2013); as a result, the distribution of these smaller magma bodies is more localized than that of the 1.6-1.8 Ga intrusions.

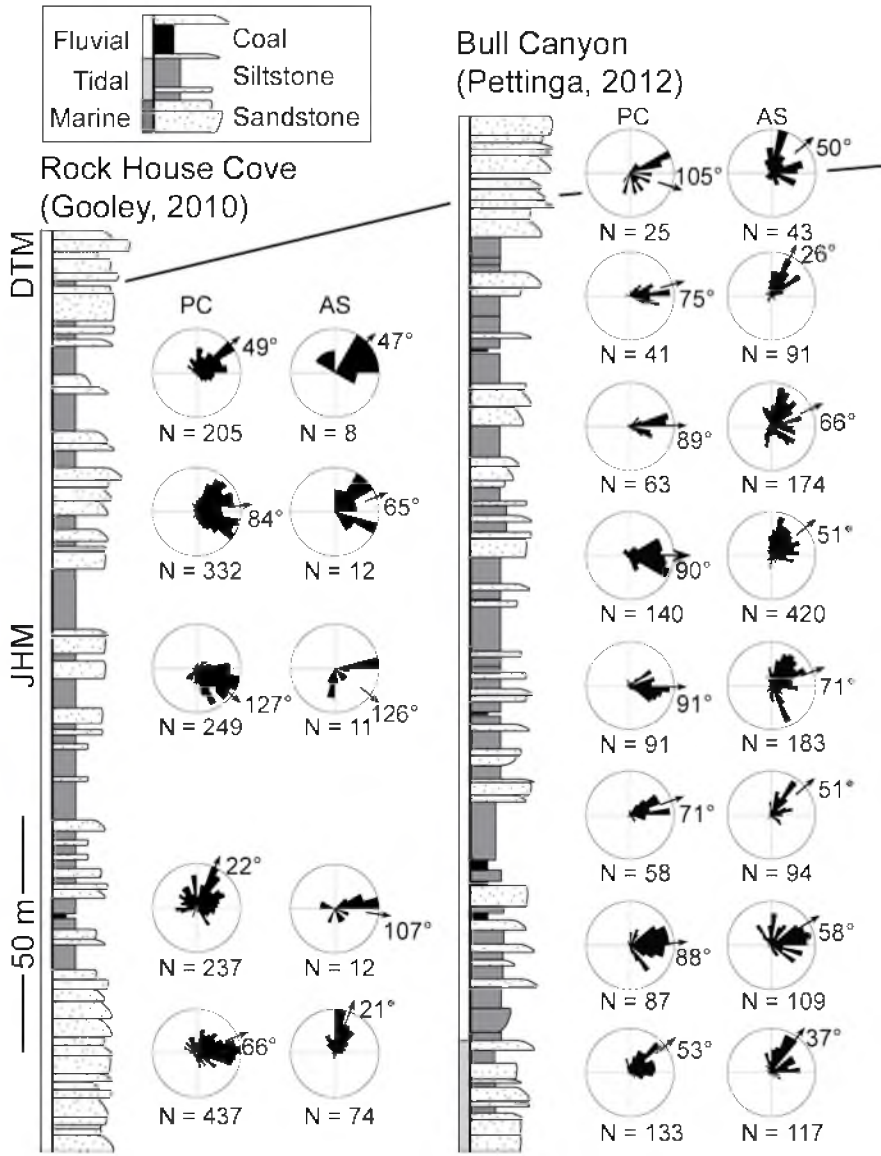
Several Proterozoic quartzite units in the Sevier thrust belt contain zircons from Population C initially derived from Yavapai-Mazatzal intrusive bodies, and have provenance signatures that may resemble the age signature of the Mogollon highlands (Dickinson and Gehrels, 2008a). However, the moderate feldspar content, and high Qm/Qp ratios in Cretaceous fluvial sandstones imply zircons comprising Population C were mainly derived from the Mogollon highlands, rather than the Sevier thrust belt by itself. Additionally, the lack of quartzite clasts in Straight Cliffs fluvial deposits (16% of clasts) implies detritus from the Proterozoic thrust sheets was primarily deposited in the most proximal foreland basin and did not actively contribute to the Kaiparowits basin at

this time. The majority of clasts are chert (81%), which were derived from Paleozoic sedimentary units in the Sevier thrust belt.

Population D: Paleoproterozoic and Archean Ages (1.9 – 3.0 Ga)

The remaining 3% of Straight Cliffs zircons are represented by the Paleoproterozoic and Archean age population. These ages form small peaks at 1.9 and 2.7 Ga and are most common in tidal samples from the John Henry Member at Kelly Grade and marine samples from Left Hand Collet (Figure 11). The primary source for these grains was Mesozoic, Paleozoic, and Precambrian units in the Sevier thrust belt (Figure 5) (Dickinson and Gehrels, 2009; Lawton et al., 2010).

Figure 7 – Paleocurrent (PC) and accretion set (AS) measurements from Rock House Cove (Gooley, 2010), Bull Canyon (Pettinga, 2012), Kelly Grade (Gallin, 2010), and Left Hand Collet (Dooling, 2012). Arrows indicate average flow/accretion direction for each interval. Vertical bars along left side of each generalized section correspond to fluvial (white), tidal (light gray) and marine (dark gray) environments.


Fluvial
Tidal
Marine
Coal
Siltstone
Sandstone
Rock House Cove
(Gooley, 2010)
Bull Canyon
(Pettinga, 2012)
DTM
JHM
50 m
PC
AS
49°
47°
N = 205
N = 8
84°
65°
N = 332
N = 12
127°
126°
N = 249
N = 11
22°
107°
N = 237
N = 12
66°
21°
N = 437
N = 74
PC
AS
105°
50°
N = 25
N = 43
75°
26°
N = 41
N = 91
89°
66°
N = 63
N = 174
90°
51°
N = 140
N = 420
91°
71°
N = 91
N = 183
71°
51°
N = 58
N = 94
88°
58°
N = 87
N = 109
53°
37°
N = 133
N = 117

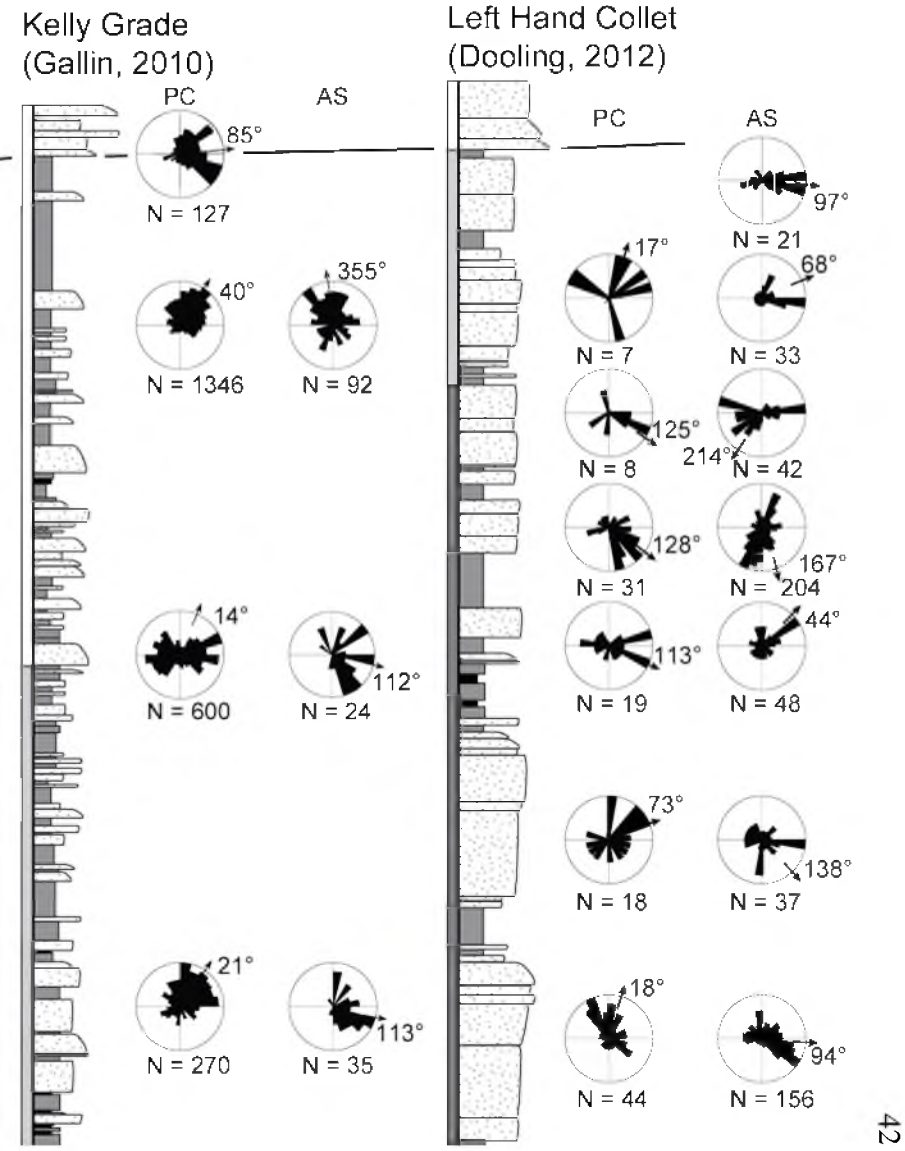
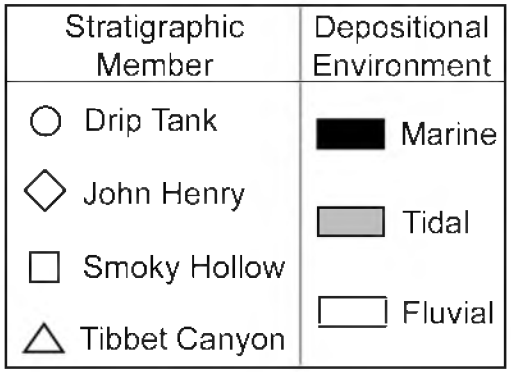
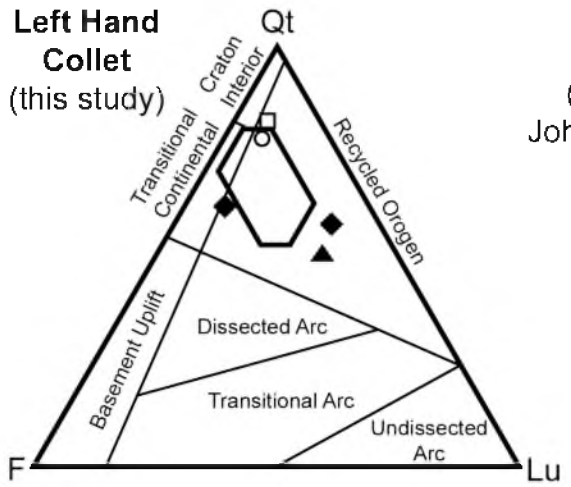
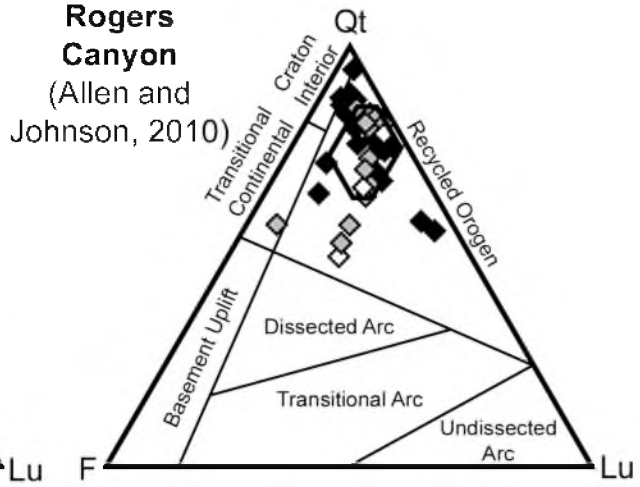
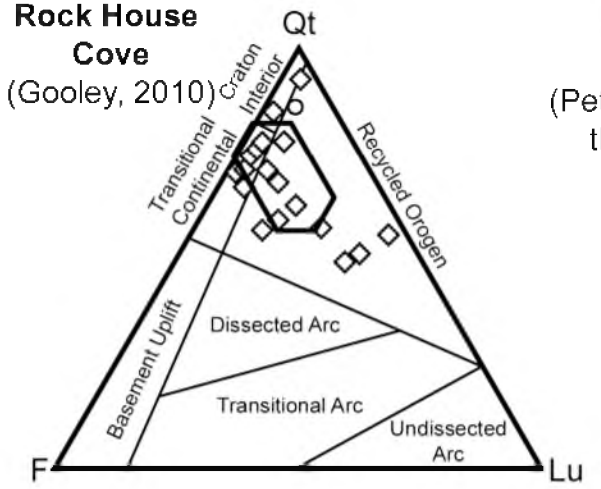

Kelly Grade
(Gallin, 2010)
Left Hand Collet
(Dooling, 2012)
PC
AS
PC
AS
85°
N = 127
97°
N = 21
17°
N = 7
68°
N = 33
40°
N = 1346
355°
N = 92
125°
N = 8
214°
N = 42
128°
N = 31
167°
N = 204
14°
N = 600
112°
N = 24
113°
N = 19
44°
N = 48
73°
N = 18
138°
N = 37
21°
N = 270
113°
N = 35
18°
N = 44
94°
N = 156

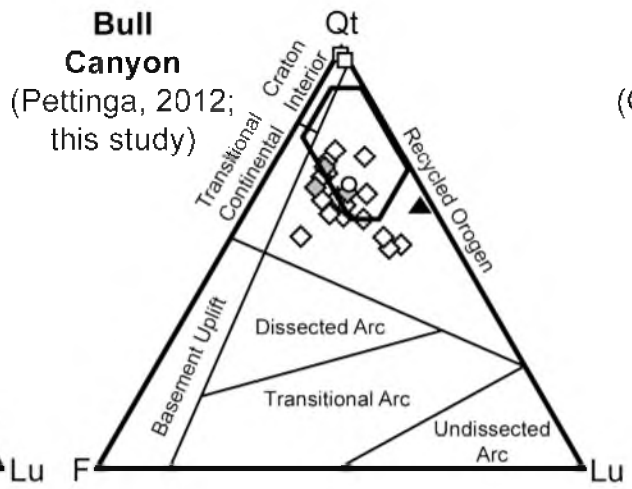
Figure 8 – Sandstone modal compositions indicating relative proportions of total quartz (Qt), feldspar (F), and unstable lithics (Lu). Each point represents data from 500 grains and the shape and shading of each point correspond to stratigraphic member and depositional environment, respectively. 1σ uncertainty for mean compositions are denoted by black polygons. Data points generally cluster within the recycled orogen, craton interior, and transitional continental categories defined by Dickinson (1985). Fluvial samples in the John Henry Member (white diamonds) contain more feldspar than marine samples from the John Henry Member (black diamonds) and Tibbet Canyon Member (black triangles).


Stratigraphic Member
Depositional Environment
Drip Tank
John Henry
Smoky Hollow
Tibbet Canyon
Marine
Tidal
Fluvial


Left Hand Collet
(this study)
Qt
Craton Interior
Transitional Continental
Recycled Orogen
Basement Uplift
Dissected Arc
Transitional Arc
Undissected Arc
F
Lu


Rogers Canyon
(Allen and Johnson, 2010)
Qt
Craton Interior
Transitional Continental
Recycled Orogen
Basement Uplift
Dissected Arc
Transitional Arc
Undissected Arc
F
Lu


Rock House Cove
(Gooley, 2010)
Qt
Craton Interior
Transitional Continental
Recycled Orogen
Basement Uplift
Dissected Arc
Transitional Arc
Undissected Arc
F
Lu


Bull Canyon
(Pettinga, 2012; this study)
Qt
Craton Interior
Transitional Continental
Recycled Orogen
Basement Uplift
Dissected Arc
Transitional Arc
Undissected Arc
F
Lu

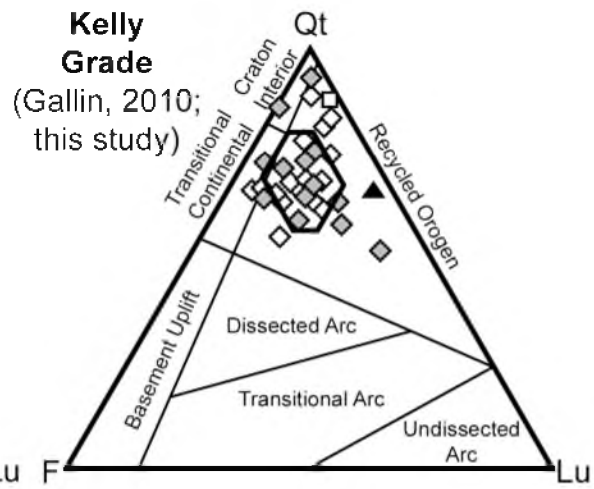
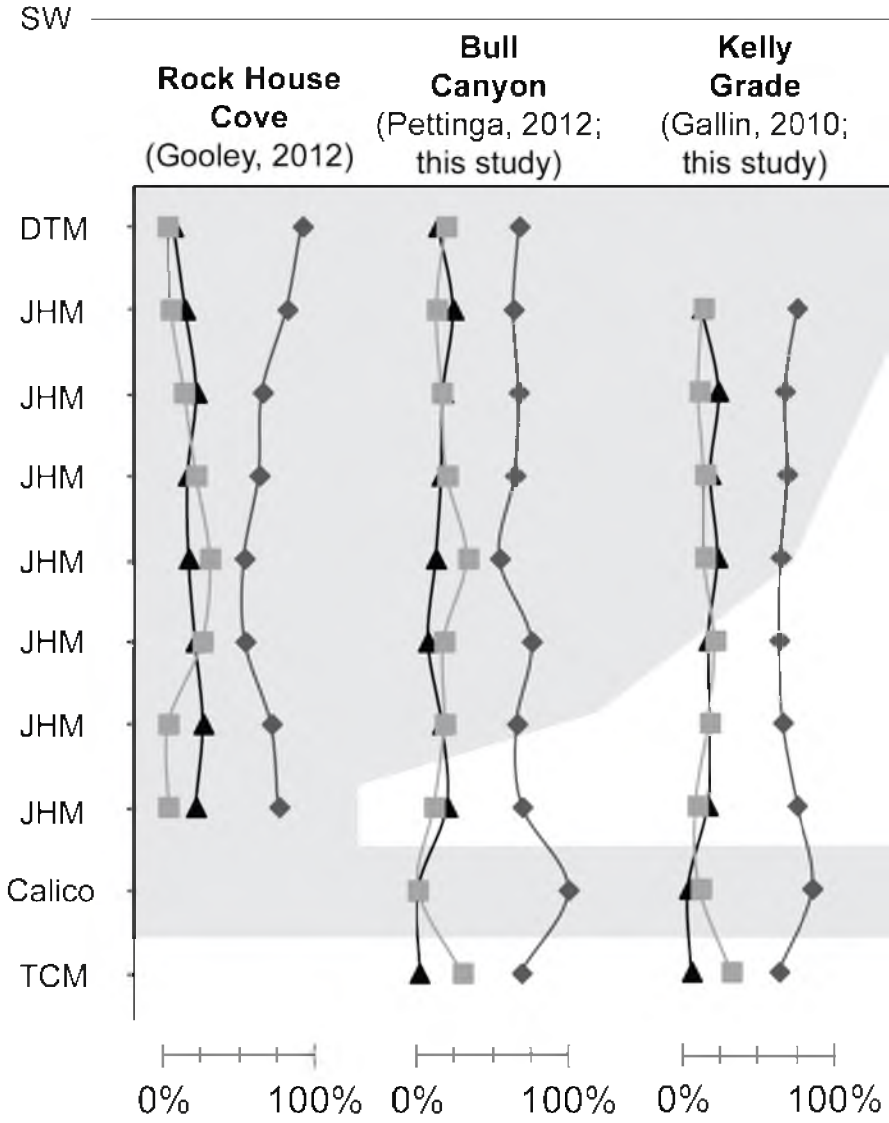

Kelly Grade
(Gallin, 2010; this study)
Qt
Craton Interior
Transitional Continental
Recycled Orogen
Basement Uplift
Dissected Arc
Transitional Arc
Undissected Arc
F
Lu

Figure 9 – Relative proportions of total quartz (Qt), feldspar (F), and unstable lithics (Lu) from several stratigraphic intervals spanning the Kaiparowits Plateau. Fluvial samples (denoted by gray background shading) from Rock House Cove (Gooley, 2010), Bull Canyon (Pettinga, 2012; this study), and Kelly Grade (Gallin, 2010; this study) record two upsection trends in sandstone composition. Calico and lower John Henry strata show an upsection decrease in total quartz with an increase in unstable lithics. Feldspar content remains relatively consistent. Upper John Henry and Drip Tank samples show a reversed trend with increased quartz content and a decrease in feldspar and unstable lithics. Marine samples show an upsection decrease in quartz and an increase in unstable lithics. Abbreviations – TCM: Tibbet Canyon Member; SHM: Smoky Hollow Member; JHM: John Henry Member; DTM: Drip Tank Member.


SW
Rock House Cove (Gooley, 2012)
Bull Canyon (Pettinga, 2012; this study)
Kelly Grade (Gallin, 2010; this study)
DTM
JHM
JHM
JHM
JHM
JHM
JHM
JHM
Calico
TCM
0%
100%
0%
100%
0%
100%

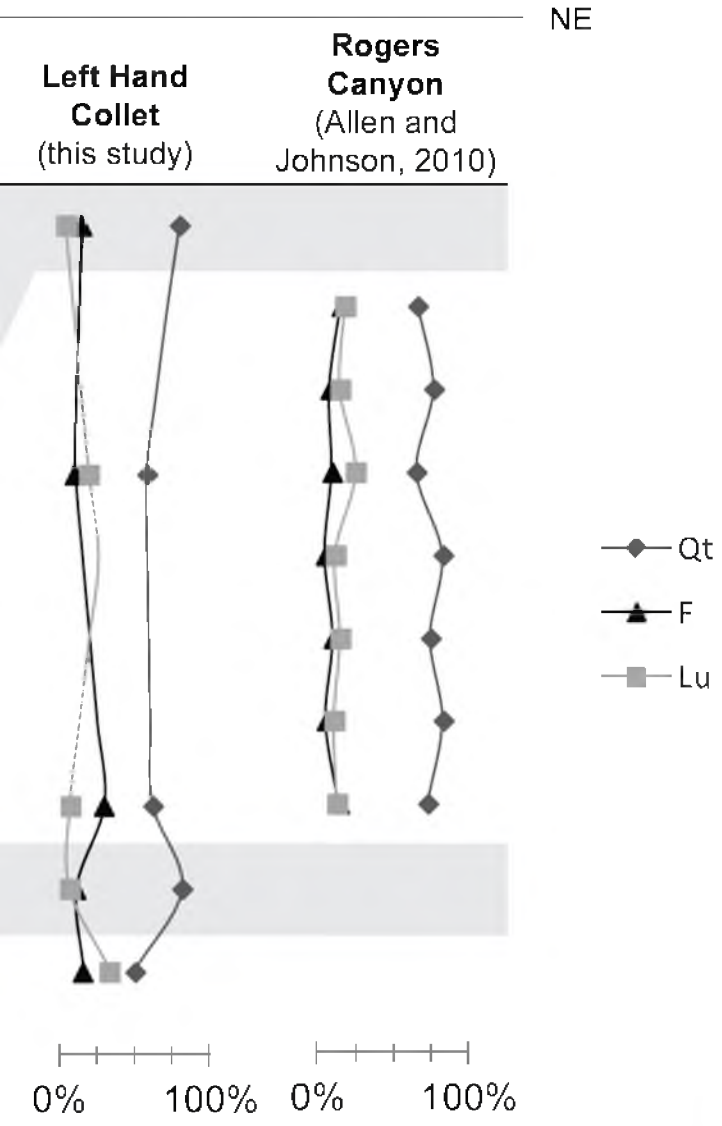

NE
Left Hand Collet (this study)
Rogers Canyon (Allen and Johnson, 2010)
Qt
F
Lu
0%
100%
0%
100%

Figure 10 – Relative probability plot containing ages from all detrital zircons in this study (N=40 samples, n=3650 grains). Left vertical axis corresponds to number of grains in each age bin (age bins span 100 Ma). Age populations are denoted by white and gray shaded bars. Population C comprises the largest percentage of all ages from the Straight Cliffs Formation (59% of all grains), followed by Population B (25%), Population A (13%), and Population D (3%).

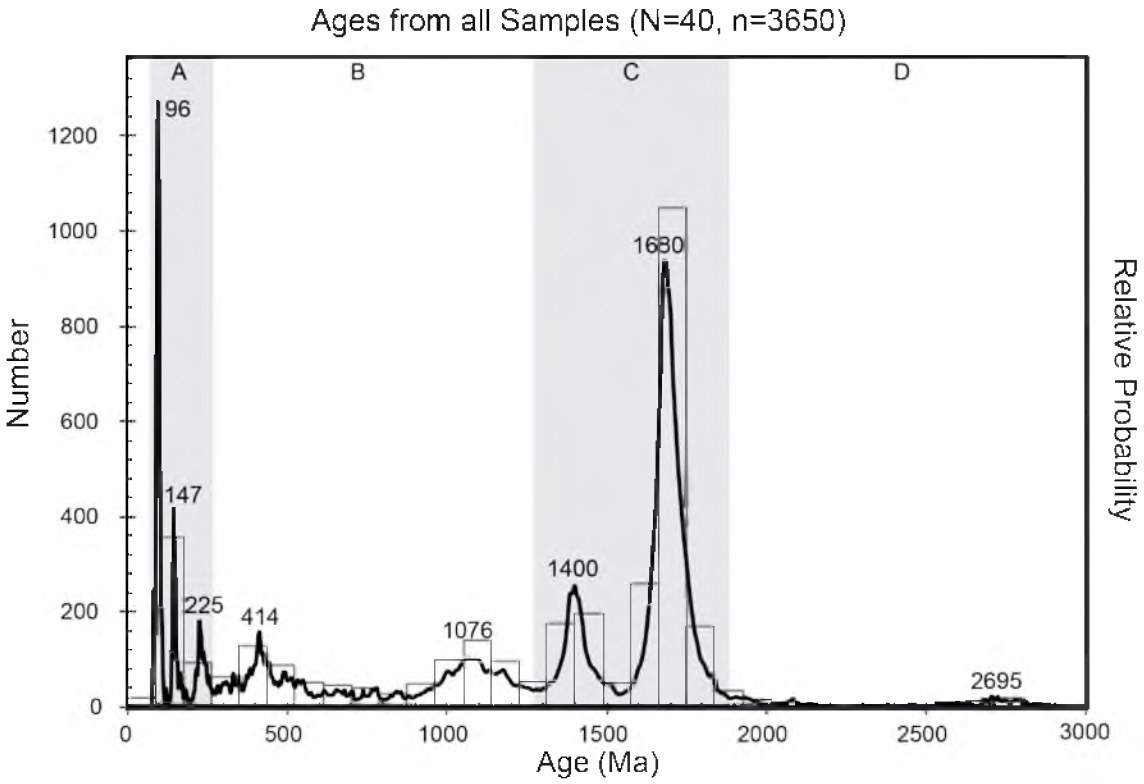

Ages from all Samples (N=40, n=3650)
A
B
C
D
96
147
225
414
1076
1400
1680
2695
Number
Relative Probability
Age (Ma)
0
200
400
600
800
1000
1200
0
500
1000
1500
2000
2500
3000

Figure 11 – Relative probability histograms for each detrital zircon sample from the Straight Cliffs Formation. Samples are grouped vertically according to location and horizontally by stratigraphic interval. The name, facies, and number of grains corresponding to each sample are labeled. Background shading designates age: Populations A (81-250 Ma), B (250-1250 Ma), C (1.25-1.90 Ga), and D (1.9-3.0 Ga). Abbreviations – TCM: Tibbet Canyon Member; SHM: Smoky Hollow Member; JHM: John Henry Member; DTM: Drip Tank Member.

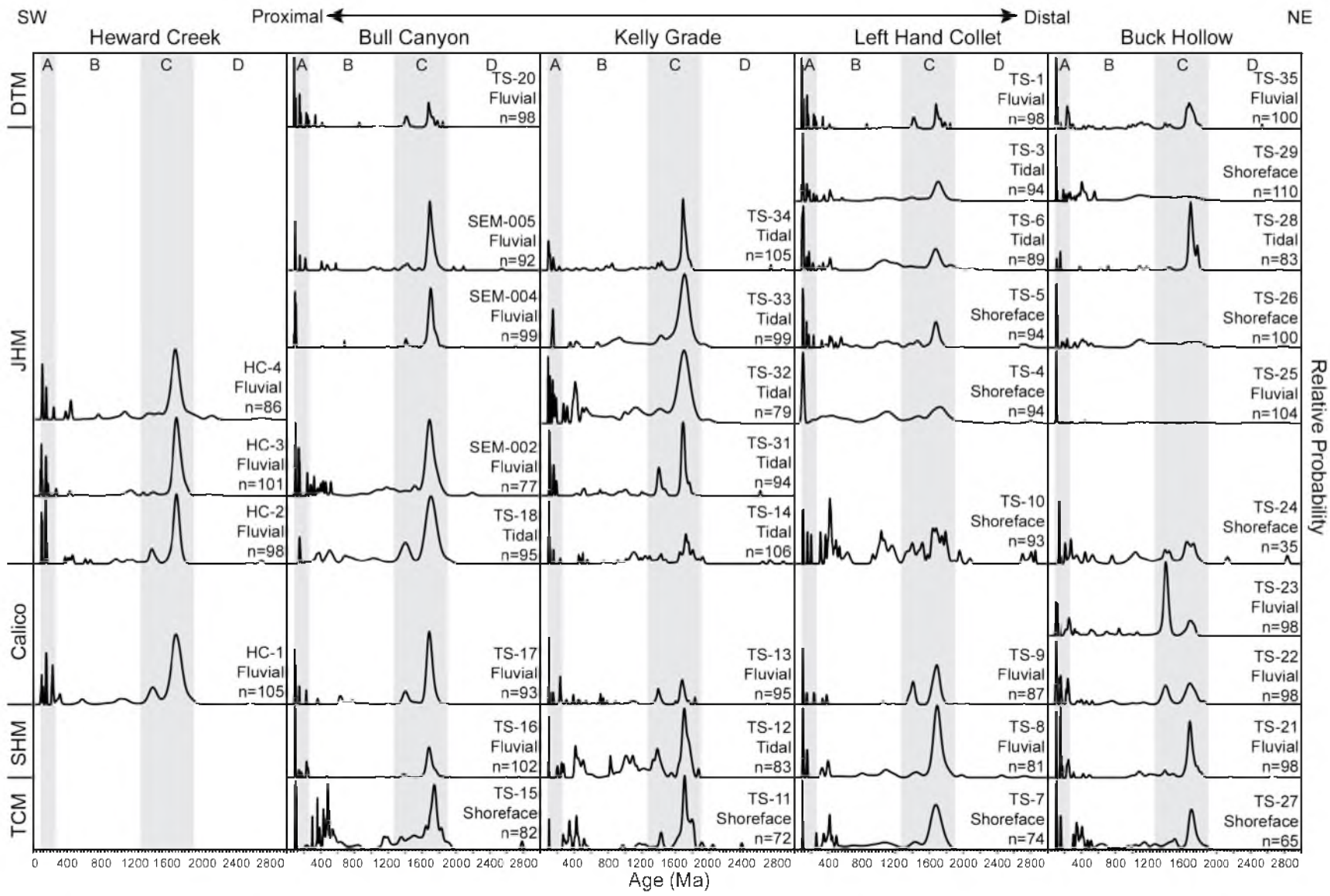

SW
Proximal
Distal
NE
Heward Creek
Bull Canyon
Kelly Grade
Left Hand Collet
Buck Hollow
DTM
JHM
Calico
SHM
TCM
A
B
C
D
HC-4 Fluvial n=86
HC-3 Fluvial n=101
HC-2 Fluvial n=98
HC-1 Fluvial n=105
TS-20 Fluvial n=98
SEM-005 Fluvial n=92
SEM-004 Fluvial n=99
SEM-002 Fluvial n=77
TS-18 Tidal n=95
TS-17 Fluvial n=93
TS-16 Fluvial n=102
TS-15 Shoreface n=82
TS-34 Tidal n=105
TS-33 Tidal n=99
TS-32 Tidal n=79
TS-31 Tidal n=94
TS-14 Tidal n=106
TS-13 Fluvial n=95
TS-12 Tidal n=83
TS-11 Shoreface n=72
TS-1 Fluvial n=98
TS-3 Tidal n=94
TS-6 Tidal n=89
TS-5 Shoreface n=94
TS-4 Shoreface n=94
TS-10 Shoreface n=93
TS-9 Fluvial n=87
TS-8 Fluvial n=81
TS-7 Shoreface n=74
TS-35 Fluvial n=100
TS-29 Shoreface n=110
TS-28 Tidal n=83
TS-26 Shoreface n=100
TS-25 Fluvial n=104
TS-24 Shoreface n=35
TS-23 Fluvial n=98
TS-22 Fluvial n=98
TS-21 Fluvial n=98
TS-27 Shoreface n=65
0 400 800 1200 1600 2000 2400 2800
Age (Ma)
Relative Probability

Figure 12 – Relative probability histogram containing the youngest 470 grains from all Straight Cliffs Formation samples representing Population A. Three subpopulations are present, with major peaks at 96 Ma, 147 Ma, and 225 Ma. Turonian-Campanian ages are plotted in Figure 14.

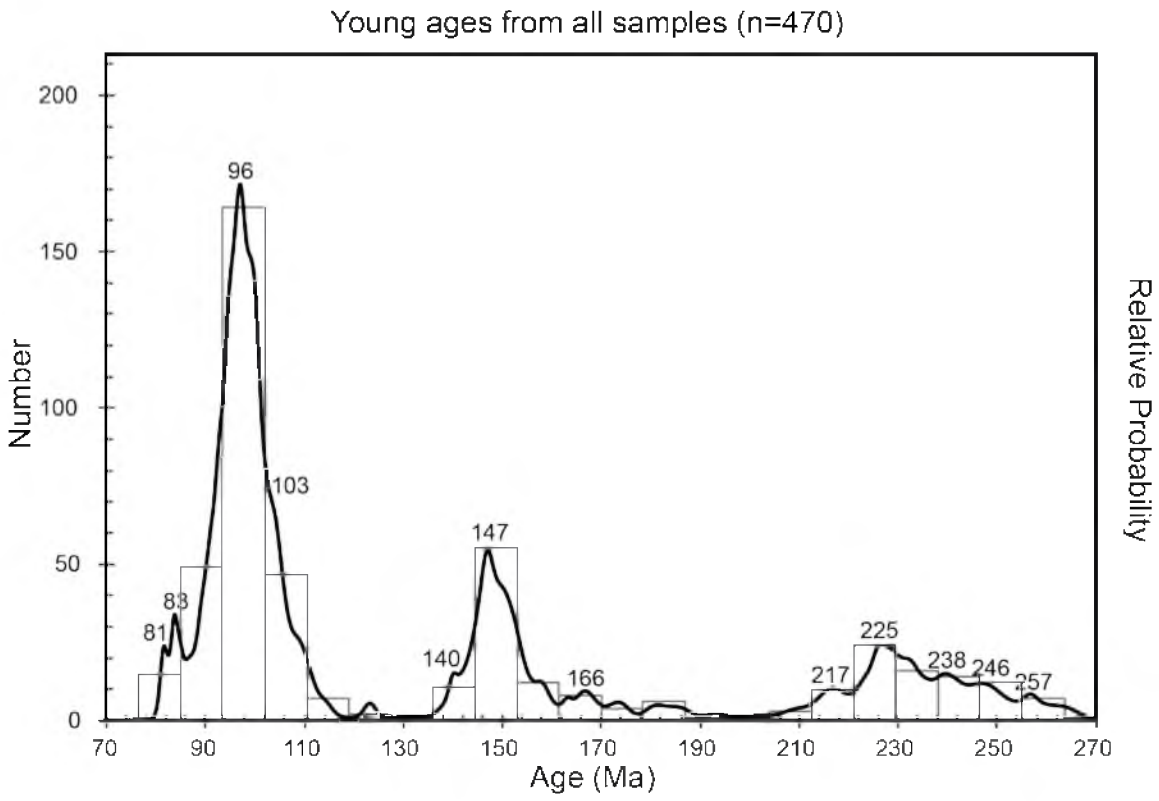

Young ages from all samples (n=470)
Number
Relative Probability
Age (Ma)
0
50
100
150
200
70
90
110
130
150
170
190
210
230
250
270
81
83
96
103
140
147
166
217
225
238
246
257

Figure 13 – Detrital zircon ages (<300 Ma) from Mesozoic sedimentary units in the Sevier thrust belt. These ages most likely correspond to Population A zircons present in Straight Cliffs samples. Modified from Dickinson and Gehrels (2009).

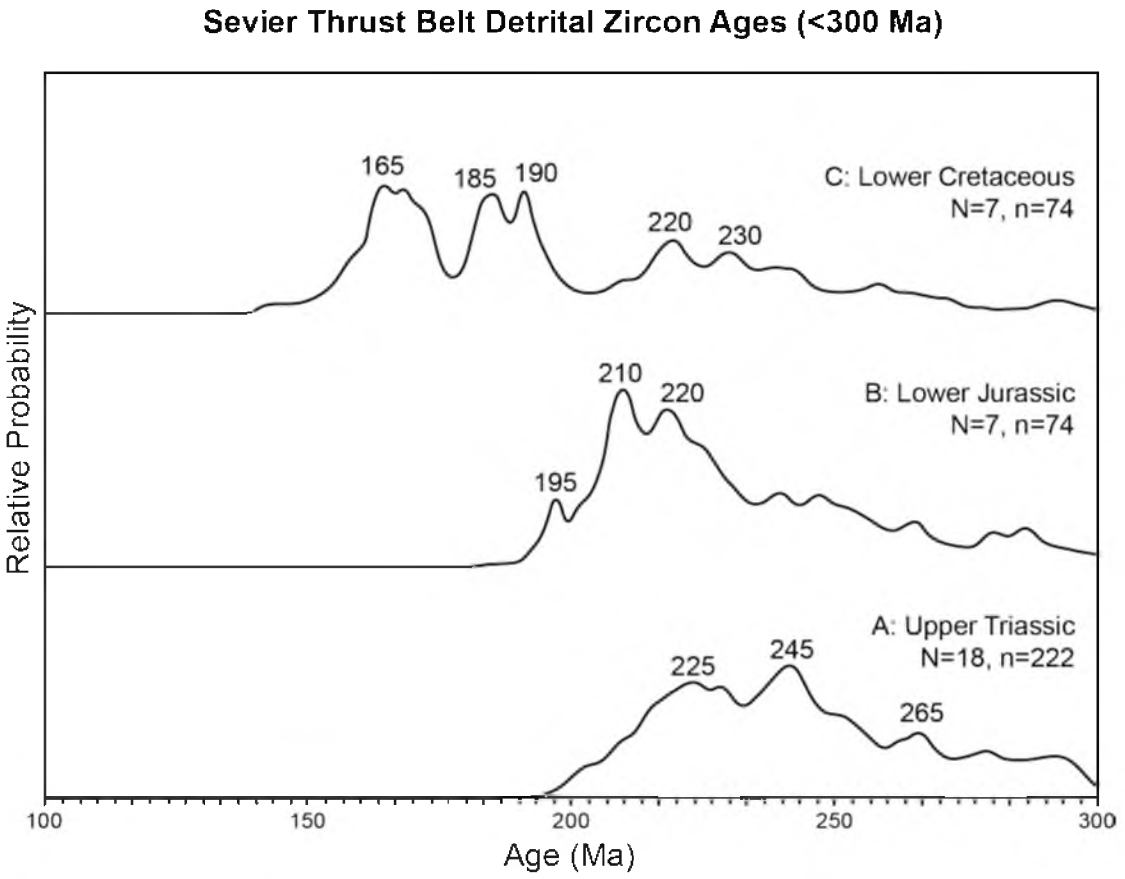

Sevier Thrust Belt Detrital Zircon Ages (<300 Ma)
Relative Probability
165
185
190
220
230
C: Lower Cretaceous
N=7, n=74
210
220
195
B: Lower Jurassic
N=7, n=74
225
245
265
A: Upper Triassic
N=18, n=222
100
150
200
250
300
Age (Ma)

Figure 14 – Relative probability plots containing the youngest seven ages from several prominent stratigraphic intervals throughout the Straight Cliffs Formation. Maximum depositional ages (with 95% confidence) are labeled for each interval, and were calculated using the weighted average of the youngest three ages that overlap at 2σ. N=number of samples, n=number of grains.

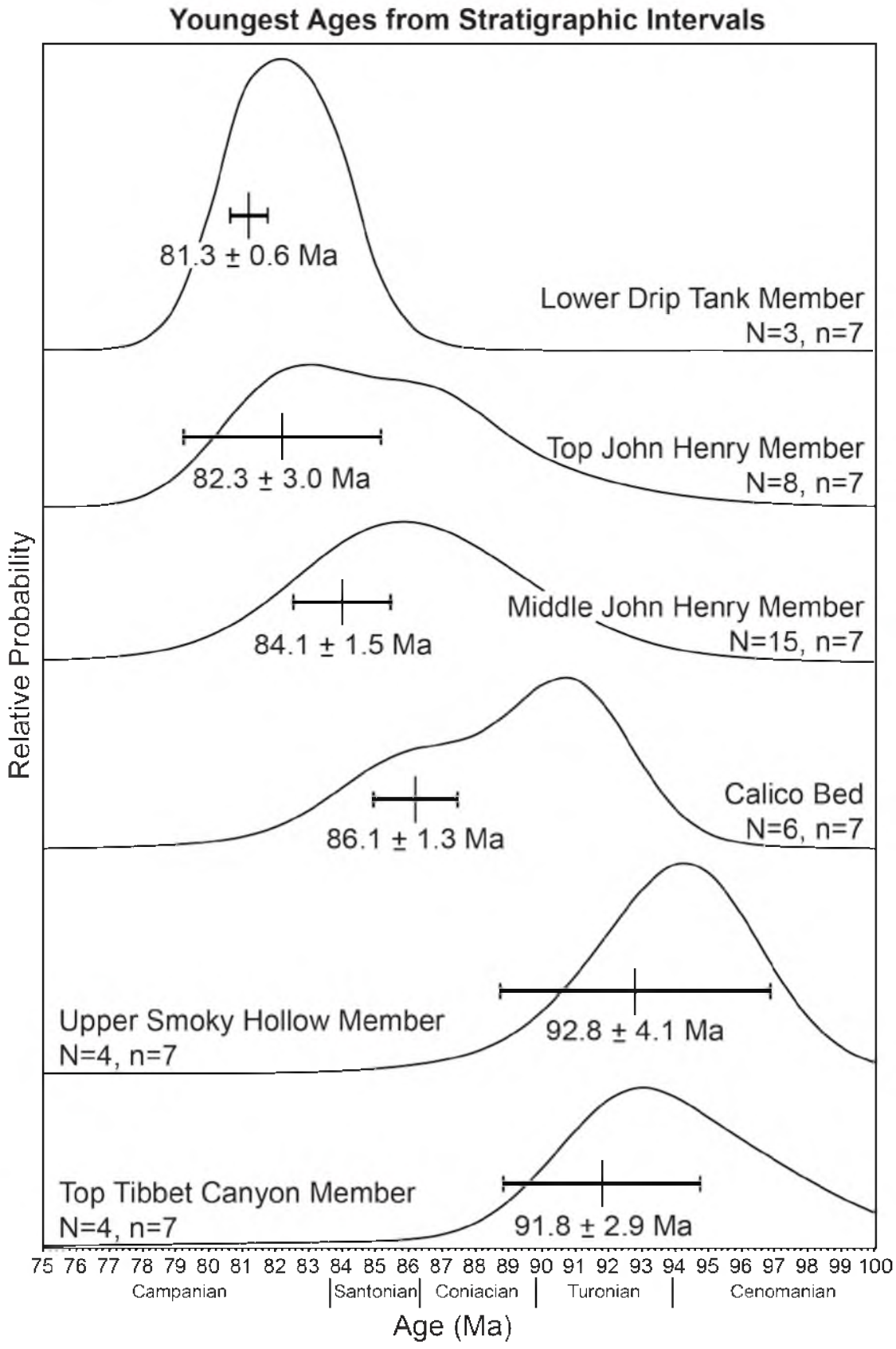

Youngest Ages from Stratigraphic Intervals
Relative Probability
81.3 ± 0.6 Ma
Lower Drip Tank Member
N=3, n=7
82.3 ± 3.0 Ma
Top John Henry Member
N=8, n=7
84.1 ± 1.5 Ma
Middle John Henry Member
N=15, n=7
86.1 ± 1.3 Ma
Calico Bed
N=6, n=7
92.8 ± 4.1 Ma
Upper Smoky Hollow Member
N=4, n=7
91.8 ± 2.9 Ma
Top Tibbet Canyon Member
N=4, n=7
75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Campanian
Santonian
Coniacian
Turonian
Cenomanian
Age (Ma)

Figure 15 – Detrital zircon ages (>295 Ma) from stratigraphic units within the Sevier thrust belt. Mesozoic strata contain an abundanc of ages from Populations A (not shown), B, and D. Precambrian strata contain zircons from Populations B, C, and D. The lack of quartzite clasts in channel lag deposits indicates the Precambrian thrust sheets in the Sevier thrust belt were not the primary source of Population C zircons. Modified from Dickinson and Gehrels (2009) and Lawton et al. (2010).

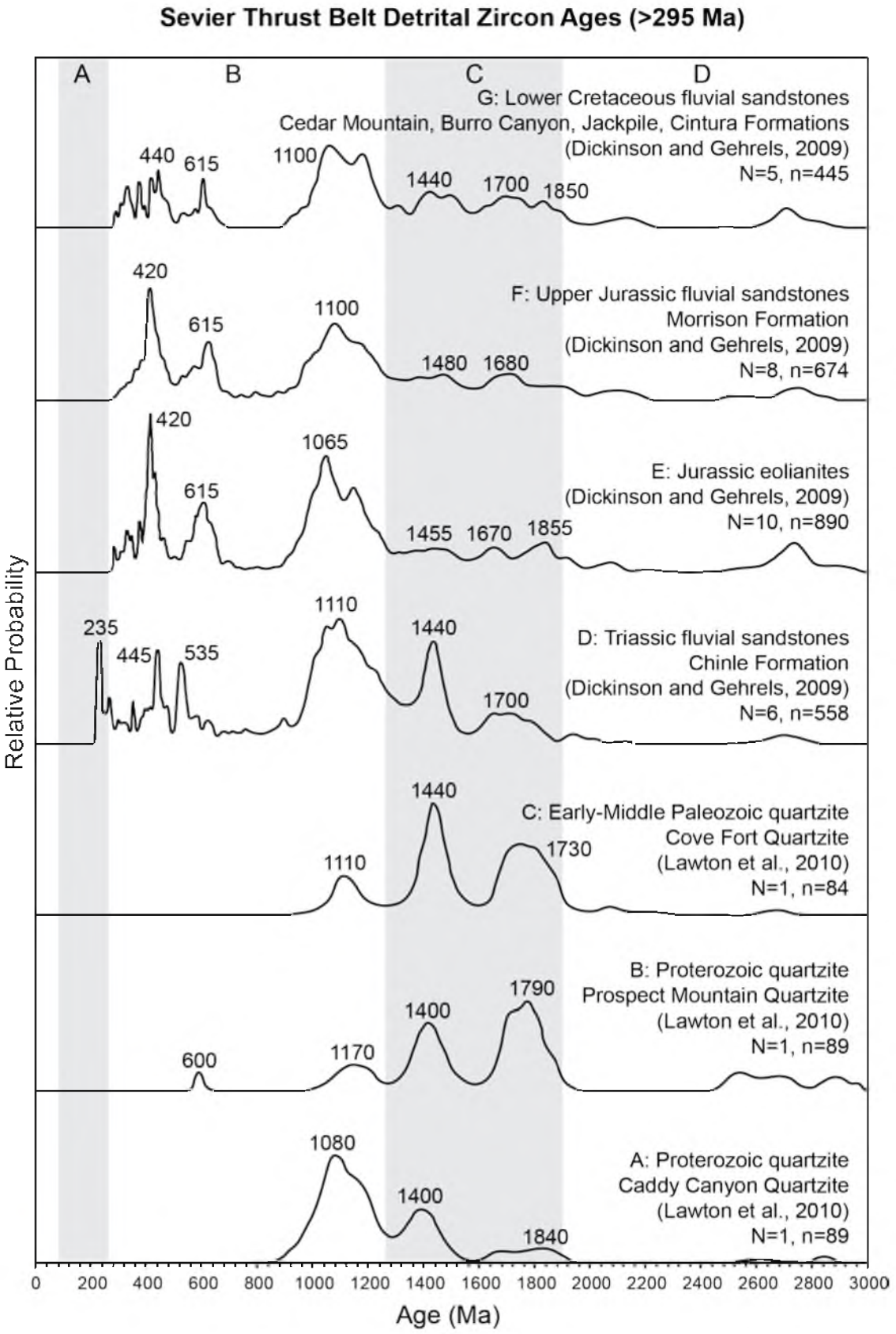

Sevier Thrust Belt Detrital Zircon Ages (>295 Ma)
A
B
C
D
G: Lower Cretaceous fluvial sandstones
Cedar Mountain, Burro Canyon, Jackpile, Cintura Formations
(Dickinson and Gehrels, 2009)
N=5, n=445
440
615
1100
1440
1700
1850
F: Upper Jurassic fluvial sandstones
Morrison Formation
(Dickinson and Gehrels, 2009)
N=8, n=674
420
615
1100
1480
1680
E: Jurassic eolianites
(Dickinson and Gehrels, 2009)
N=10, n=890
420
615
1065
1455
1670
1855
D: Triassic fluvial sandstones
Chinle Formation
(Dickinson and Gehrels, 2009)
N=6, n=558
235
445
535
1110
1440
1700
C: Early-Middle Paleozoic quartzite
Cove Fort Quartzite
(Lawton et al., 2010)
N=1, n=84
1110
1440
1730
B: Proterozoic quartzite
Prospect Mountain Quartzite
(Lawton et al., 2010)
N=1, n=89
600
1170
1400
1790
A: Proterozoic quartzite
Caddy Canyon Quartzite
(Lawton et al., 2010)
N=1, n=89
1080
1400
1840
Relative Probability
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Age (Ma)

Table 2

Sandstone compositional data

Sample Name	Location	Interval	Facies	Qt	F	Lu
RHC_S10	Rock House Cove	DTM	Fluvial	92%	6%	2%
RHC_S9	Rock House Cove	U JHM	Fluvial	76%	20%	4%
RHC_S24	Rock House Cove	U JHM	Fluvial	94%	3%	3%
RHC_S40	Rock House Cove	U JHM	Fluvial	79%	14%	7%
RHC_S8	Rock House Cove	U JHM	Fluvial	78%	19%	3%
RHC_S7	Rock House Cove	U JHM	Fluvial	71%	21%	8%
RHC_S6	Rock House Cove	U JHM	Fluvial	68%	20%	12%
RHC_S5	Rock House Cove	U JHM	Fluvial	63%	20%	18%
RHC_S34	Rock House Cove	U JHM	Fluvial	59%	25%	16%
RHC_S4	Rock House Cove	M JHM	Fluvial	71%	28%	2%
RHC_S30	Rock House Cove	M JHM	Fluvial	56%	4%	41%
RHC_S3	Rock House Cove	M JHM	Fluvial	57%	17%	26%
RHC_S27	Rock House Cove	M JHM	Fluvial	49%	16%	35%
RHC_S23	Rock House Cove	L JHM	Fluvial	51%	12%	37%
RHC_S1	Rock House Cove	L JHM	Fluvial	57%	30%	14%
RHC_S19	Rock House Cove	L JHM	Fluvial	71%	26%	3%
RHC_S18	Rock House Cove	L JHM	Fluvial	67%	28%	5%
RHC_S16	Rock House Cove	L JHM	Fluvial	75%	22%	2%
RHC_S13	Rock House Cove	L JHM	Fluvial	76%	21%	3%
RHC_S15	Rock House Cove	L JHM	Fluvial	86%	13%	1%
BC-P-04	Bull Canyon	DTM	Fluvial	67%	14%	19%
BC-P-05	Bull Canyon	U JHM	Fluvial	56%	30%	14%
BCSE-U-008	Bull Canyon	U JHM	Fluvial	71%	18%	11%
BCSE-008	Bull Canyon	U JHM	Fluvial	77%	12%	11%
BCSE-U-007	Bull Canyon	U JHM	Fluvial	62%	21%	17%
BCSE-007	Bull Canyon	U JHM	Fluvial	65%	17%	17%
BCSE-U-006	Bull Canyon	U JHM	Fluvial	64%	17%	19%
BCSE-006	Bull Canyon	M JHM	Fluvial	74%	15%	10%
BCSE-U-005	Bull Canyon	M JHM	Fluvial	60%	15%	25%
BCSE-005	Bull Canyon	M JHM	Fluvial	65%	21%	14%
BCSE-M-006	Bull Canyon	M JHM	Fluvial	71%	17%	12%
BCSE-004	Bull Canyon	M JHM	Fluvial	54%	13%	33%
BCSE-U-004	Bull Canyon	M JHM	Fluvial	61%	18%	20%
BCSE-U-003	Bull Canyon	M JHM	Fluvial	66%	11%	23%
BCSE-003	Bull Canyon	M JHM	Fluvial	55%	14%	32%
BCSE-002	Bull Canyon	M JHM	Tidal	54%	11%	35%
BCSE-001	Bull Canyon	L JHM	Tidal	76%	7%	18%
BC-P-07	Bull Canyon	L JHM	Tidal	66%	16%	18%
BCSE-M-001	Bull Canyon	L JHM	Tidal	72%	17%	11%
BC-P-01	Bull Canyon	L JHM	Tidal	67%	22%	11%
BC-P-06	Bull Canyon	Calico	Fluvial	100%	0%	0%
BC-P-02	Bull Canyon	Calico	Fluvial	100%	0%	0%
TS-15	Bull Canyon	TCM	Marine	69%	1%	30%

Table 2 Continued

Sample Name	Location	Interval	Facies	Qt	F	Lu
SC9	Kelly Grade	U JHM	Fluvial	64%	24%	13%
SC8	Kelly Grade	U JHM	Fluvial	69%	17%	15%
SC15	Kelly Grade	U JHM	Fluvial	75%	9%	17%
SC14	Kelly Grade	U JHM	Fluvial	83%	4%	13%
SC13	Kelly Grade	U JHM	Fluvial	68%	13%	18%
SC12	Kelly Grade	U JHM	Fluvial	67%	19%	14%
SC11	Kelly Grade	U JHM	Fluvial	78%	12%	10%
SC10	Kelly Grade	U JHM	Fluvial	65%	24%	11%
MC17	Kelly Grade	U JHM	Fluvial	82%	6%	13%
MC16	Kelly Grade	U JHM	Fluvial	82%	6%	13%
MC15	Kelly Grade	U JHM	Fluvial	66%	28%	6%
MC14	Kelly Grade	U JHM	Fluvial	64%	17%	19%
MC13	Kelly Grade	U JHM	Fluvial	67%	26%	7%
MC12	Kelly Grade	U JHM	Fluvial	62%	17%	21%
MC11	Kelly Grade	U JHM	Fluvial	68%	19%	13%
MC10	Kelly Grade	U JHM	Fluvial	55%	28%	16%
SC7	Kelly Grade	M JHM	Tidal	58%	15%	28%
SC6	Kelly Grade	M JHM	Tidal	68%	20%	11%
SC5	Kelly Grade	M JHM	Tidal	52%	10%	39%
SC4	Kelly Grade	M JHM	Tidal	67%	16%	17%
MC8	Kelly Grade	M JHM	Tidal	73%	14%	13%
MC7	Kelly Grade	M JHM	Tidal	59%	23%	18%
MC6	Kelly Grade	M JHM	Tidal	63%	13%	24%
MC5	Kelly Grade	M JHM	Tidal	64%	27%	8%
MC4	Kelly Grade	M JHM	Tidal	75%	12%	13%
SC3	Kelly Grade	L JHM	Tidal	72%	23%	5%
SC2	Kelly Grade	L JHM	Tidal	71%	20%	10%
SC1	Kelly Grade	L JHM	Tidal	92%	4%	4%
MC3	Kelly Grade	L JHM	Tidal	68%	18%	14%
MC2	Kelly Grade	L JHM	Tidal	64%	18%	18%
MC1	Kelly Grade	L JHM	Tidal	86%	14%	0%
TS-13	Kelly Grade	Calico	Fluvial	85%	3%	11%
TS-12	Kelly Grade	TCM	Marine	63%	5%	32%
TS-1	Left Hand Collet	DTM	Fluvial	80%	15%	5%
TS-6	Left Hand Collet	U JHM	Marine	59%	10%	20%
TS-10	Left Hand Collet	L JHM	Marine	62%	30%	8%
TS-9	Left Hand Collet	Calico	Fluvial	82%	11%	7%
TS-7	Left Hand Collet	TCM	Marine	51%	16%	34%
CR-150	Rogers Canyon	U JHM	Fluvial	49%	28%	23%
CR-163	Rogers Canyon	U JHM	Fluvial	66%	14%	20%
EN-150	Rogers Canyon	U JHM	Tidal	53%	25%	22%

Table 2 Continued

Sample Name	Location	Interval	Facies	Qt	F	Lu
EN-157	Rogers Canyon	U JHM	Marine	82%	2%	15%
SWBC-172	Rogers Canyon	U JHM	Marine	81%	9%	11%
BCE-T	Rogers Canyon	U JHM	Marine	82%	7%	11%
CR-105	Rogers Canyon	U JHM	Marine	78%	6%	16%
SWBC-147	Rogers Canyon	U JHM	Tidal	70%	12%	18%
CR-47	Rogers Canyon	M JHM	Marine	59%	6%	35%
EN-130	Rogers Canyon	M JHM	Marine	68%	9%	22%
MCE-101	Rogers Canyon	M JHM	Marine	71%	10%	20%
MCE-136	Rogers Canyon	M JHM	Marine	72%	18%	9%
MCW-95	Rogers Canyon	M JHM	Marine	57%	5%	39%
CR-30	Rogers Canyon	M JHM	Tidal	84%	6%	10%
MCM-187	Rogers Canyon	M JHM	Marine	76%	4%	20%
MCW-85	Rogers Canyon	M JHM	Marine	89%	6%	6%
BCE-55	Rogers Canyon	L JHM	Tidal	67%	13%	21%
BCE-75	Rogers Canyon	L JHM	Marine	86%	8%	5%
CR-16	Rogers Canyon	L JHM	Tidal	84%	4%	12%
EN-34	Rogers Canyon	L JHM	Tidal	57%	36%	6%
EN-48	Rogers Canyon	L JHM	Tidal	82%	3%	15%
MCE-84	Rogers Canyon	L JHM	Marine	79%	6%	16%
MCM-161	Rogers Canyon	L JHM	Tidal	57%	22%	21%
MCW-70	Rogers Canyon	L JHM	Tidal	84%	6%	10%
MCW-75	Rogers Canyon	L JHM	Marine	69%	10%	21%
NBC-27	Rogers Canyon	L JHM	Tidal	82%	4%	14%
NBCC-41	Rogers Canyon	L JHM	Tidal	82%	4%	14%
NBCE-40	Rogers Canyon	L JHM	Tidal	80%	6%	14%
NBCE-52	Rogers Canyon	L JHM	Tidal	73%	9%	17%
SWBC-52	Rogers Canyon	L JHM	Tidal	65%	15%	21%
BCE-46	Rogers Canyon	L JHM	Marine	87%	8%	5%
BCE-7	Rogers Canyon	L JHM	Fluvial	78%	4%	18%
CR-5	Rogers Canyon	L JHM	Marine	87%	5%	8%
EN-97	Rogers Canyon	L JHM	Marine	76%	4%	20%
MCE-35	Rogers Canyon	L JHM	Tidal	81%	5%	13%
MCM-119	Rogers Canyon	L JHM	Marine	94%	2%	4%
MCM-154	Rogers Canyon	L JHM	Marine	77%	10%	13%
SWBC-17	Rogers Canyon	L JHM	Marine	84%	9%	8%
EN-12	Rogers Canyon	L JHM	Marine	80%	5%	15%
EN-19	Rogers Canyon	L JHM	Marine	65%	24%	11%

Rock House Cove (Gooley, 2010); Bull Canyon (Pettinga, 2012; this study); Kelly Grade (Gallin, 2010; this study); Left Hand Collet (this study); Rogers Canyon (Allen and Johnson, 2010). Abbreviations – L/M/U JHM: lower/middle/upper John Henry Member; DTM: Drip Tank Member; TCM: Tibbet Canyon Member.

Table 3

Distribution of detrital zircon ages in each population

Sample Name	Location	Interval	Facies	# Grains	A	B	C	D
HC-4	Heward Creek	M JHM	Fluvial	86	8%	14%	72%	6%
HC-3	Heward Creek	L JHM	Fluvial	101	11%	9%	78%	2%
HC-2	Heward Creek	L JHM	Fluvial	98	12%	15%	69%	3%
HC-1	Heward Creek	Calico	Fluvial	105	11%	12%	76%	1%
TS-20	Bull Canyon	DTM	Fluvial	98	27%	19%	53%	1%
SEM-005	Bull Canyon	M JHM	Fluvial	109	8%	22%	68%	2%
SEM-004	Bull Canyon	L JHM	Fluvial	99	13%	4%	81%	2%
SEM-002	Bull Canyon	L JHM	Fluvial	77	9%	22%	68%	1%
TS-18	Bull Canyon	L JHM	Tidal	94	3%	27%	69%	1%
TS-17	Bull Canyon	Calico	Fluvial	93	10%	13%	77%	0%
TS-16	Bull Canyon	SHM	Fluvial	102	23%	11%	64%	3%
TS-15	Bull Canyon	TCM	Marine	82	6%	37%	55%	2%
TS-30	Tibbet Canyon	L JHM	Tidal	89	7%	18%	75%	0%
TS-34	Kelly Grade	M JHM	Tidal	105	12%	17%	69%	2%
TS-33	Kelly Grade	L JHM	Tidal	99	4%	20%	75%	1%
TS-32	Kelly Grade	L JHM	Tidal	79	6%	35%	57%	1%
TS-31	Kelly Grade	L JHM	Tidal	94	14%	19%	66%	1%
TS-14	Kelly Grade	L JHM	Tidal	99	10%	33%	52%	4%
TS-13	Kelly Grade	Calico	Fluvial	95	20%	27%	52%	1%
TS-12	Kelly Grade	SHM	Tidal	83	5%	42%	53%	0%
TS-11	Kelly Grade	TCM	Marine	72	1%	31%	63%	6%
TS-1	Left Hand Collet	DTM	Fluvial	101	24%	28%	45%	4%
TS-3	Left Hand Collet	JHM "G"	Tidal	96	18%	29%	50%	3%
TS-6	Left Hand Collet	JHM "F"	Tidal	89	19%	34%	40%	7%
TS-5	Left Hand Collet	JHM "E"	Marine	94	13%	37%	44%	6%
TS-4	Left Hand Collet	JHM "D"	Marine	94	18%	39%	36%	6%
TS-10	Left Hand Collet	JHM "A"	Marine	93	4%	45%	42%	9%
TS-9	Left Hand Collet	Calico	Fluvial	88	10%	7%	80%	3%
TS-8	Left Hand Collet	SHM	Fluvial	81	9%	22%	64%	5%
TS-7	Left Hand Collet	TCM	Marine	74	4%	39%	57%	0%

Abbreviations – TCM: Tibbet Canyon Member; SHM: Smoky Hollow Member; L JHM: Lower John Henry Member; M JHM: Middle John Henry Member; U JHM: Upper John Henry Member; DTM: Drip Tank Member.

Table 3 Continued

Sample Name	Location	Interval	Facies	# Grains	A	B	C	D
TS-35	Buck Hollow	DTM	Fluvial	100	25%	27%	47%	1%
TS-29	Buck Hollow	U JHM	Marine	110	14%	51%	30%	5%
TS-28	Buck Hollow	M JHM	Tidal	83	4%	11%	84%	1%
TS-26	Buck Hollow	M JHM	Marine	100	17%	36%	38%	9%
TS-25	Buck Hollow	L JHM	Fluvial	104	43%	31%	17%	9%
TS-24	Buck Hollow	L JHM	Marine	35	9%	40%	46%	6%
TS-23	Buck Hollow	Calico	Fluvial	88	14%	18%	68%	0%
TS-22	Buck Hollow	Calico	Fluvial	98	27%	15%	58%	0%
TS-21	Buck Hollow	SHM	Fluvial	98	19%	14%	63%	3%
TS-27	Buck Hollow	TCM	Marine	65	8%	40%	52%	0%

Abbreviations – TCM: Tibbet Canyon Member; SHM: Smoky Hollow Member; L JHM: Lower John Henry Member; M JHM: Middle John Henry Member; U JHM: Upper John Henry Member; DTM: Drip Tank Member.

Table 4

Means and standard deviations for each age population

	A	B	C	D
Marine	10% ± 6%	40% ± 5%	45% ± 10%	5% ± 3%
Tidal	9% ± 6%	26% ± 10%	63% ± 13%	2% ± 2%
Fluvial	17% ± 9%	17% ± 8%	63% ± 16%	3% ± 2%
Total	13% ± 5%	25% ± 12%	59% ± 15%	3% ± 3%

DISCUSSION

Results from detrital zircon geochronology, sandstone petrography, and paleocurrent analyses provide evidence for sediment delivery from the Mogollon highlands, Sevier fold-thrust belt, and Cordilleran volcanic arc into the Turonian-Campanian foreland basin of southern Utah (Figure 5). Spatial and temporal provenance trends provide insight into the evolution of axial and transverse fluvial systems in the Cordilleran foreland basin. Variations in sedimentary provenance are discussed in the context of tectonic, climactic, and eustatic controls.

Spatial Provenance Trends

Detrital zircon age signatures vary spatially across the Kaiparowits Plateau, and this is largely linked to variations in depositional processes and sediment delivery mechanisms associated with each environment. There is a higher proportion of sediment derived from the Sevier thrust belt (Populations B and D) in samples from the northern and eastern plateau (Left Hand Collet, Buck Hollow, and Kelly Grade, Figure 11) relative to samples collected in the western plateau (Bull Canyon and Heward Creek, Figure 11). Up to 35% of zircons from Left Hand Collet are represented by Populations B and D, and individual samples include as many as 54% (TS-10). At Buck Hollow and Kelly Grade, a similar high proportion was observed, with 31% and 29% of all ages corresponding to

Populations B and D, respectively. By comparison, Populations B and D only comprise 19% of ages at Bull Canyon and 15% at Heward Creek (Figure 11).

This spatial change is linked to the transition from fluvial dominated deposition in the southern and western Kaiparowits Plateau to tidal and marine deposition in the northern and eastern plateau (Figure 16). The fluvial sections at Heward Creek and Bull Canyon were primarily fed by rivers draining the Mogollon highlands with subordinate input from the Sevier thrust belt and Cordilleran volcanic arc. The higher proportion of zircons from the Sevier thrust belt in marine and tidal samples implies additional sediment was derived from the Sevier sources via longshore currents and was mixed with Mogollon sediment in the shoreface environment; if the marine samples were only fed by the fluvial systems depositing at Bull Canyon and Heward Creek, the age signatures of fluvial, tidal, and marine samples would be more similar. When compared using Kolmogorov-Smirnov (K-S) statistics (Press, 1986; Guynn and Gehrels, 2006), the resultant p-values for fluvial-tidal, fluvial-marine, and tidal-marine comparisons are 0.002, 0.000, and 0.000, respectively. P-values less than 0.05, imply the three facies types were unlikely to have received the same proportion of sediment from the Mogollon highlands, Sevier thrust belt, and Cordilleran volcanic arc.

A comparison of the two fluvial-dominated successions (Bull Canyon and Heward Creek, Figure 11) reveals only minor spatial age signature variations within this environment of deposition. Samples near the base of the John Henry Member at Heward Creek (HC-2) and Bull Canyon (SEM-002) yield a K-S p-value of 0.898, implying a statistically significant likelihood that these zircons were derived from the same sources. Detrital zircon ages from both locations show similar proportions of each age population.

At Heward Creek, 74% of ages correspond with Population C, 13% with Population B, 11% with Population A, and 2% with Population D. At Bull Canyon, 74% correspond with Population C, whereas 15%, 8%, and 2% correspond with Populations B, A, and D, respectively.

Temporal Provenance Trends

Detrital zircon ages record upsection trends that coincide with temporal variations in stratigraphic architectural elements and petrologic data (Figure 17). In general, temporal trends reveal that fluvial dominated successions (Heward Creek and Bull Canyon) record an upsection decrease in Mogollon highland-derived sediment through the John Henry Member with an increase in sediment derived from the Sevier thrust belt and volcanic sources. The quartz-rich, highly amalgamated fluvial channels of the Calico bed and lower John Henry Member contain a predominance of Mogollon highlands-derived zircons. This provenance signature is maintained through lower and middle John Henry Member strata, despite a higher proportion of feldspar and unstable lithic grains noted in the isolated channel deposits. This compositional change is likely due to an increase in basin accommodation rates, and subsequently, a higher preservation potential for these easily erodible mineral types. The highly amalgamated and braided fluvial deposits of the upper John Henry and Drip Tank members show an increase in sediment derived from the Sevier thrust belt. In the Calico Bed at Bull Canyon (TS-17), Population C from the Mogollon highlands comprises 77% of zircons in the sample, whereas the Drip Tank Member (TS-20) only contains 53% of zircons from Population C (Figure 11). The K-S p-value comparing these two samples (0.000) indicates a statistically likely

probability that these samples were not supplied from source terranes with identical age signatures.

In tidal and marine dominated successions (Kelly Grade, Left Hand Collet, and Buck Hollow), Populations A and C show upsection increases, whereas Populations B and D decrease in relative abundance. The temporal increase in Mogollon highland and volcanic arc detritus is likely due to the increase in fluvial influence at the shoreline as fluvial facies prograded eastward through time.

Distribution and Evolution of Transverse and Axial Drainages

Provenance data imply the majority of Straight Cliffs Formation sediment was derived from the Mogollon highlands, with moderate contributions from the Sevier thrust belt and subordinate input from the Cordilleran volcanic arc. The relationships between source terranes and stratigraphic architecture in the Straight Cliffs Formation suggests deposition occurred in a northeast flowing axial river system fed by transverse distributive fluvial systems (DFSs) draining the Mogollon highlands and Sevier thrust belt (Figure 18).

The abundance of sediment derived from the Mogollon highlands indicates a significant fluvial system linked the Mogollon highlands to the Western Interior Seaway, passing through the Kaiparowits region along the way. Because most Upper Cretaceous fluvial deposits between the Kaiparowits Plateau and central Arizona have been removed by erosion, the sedimentology of these deposits remains largely speculative. With the Maria thrust front ~400 kilometers south of the Kaiparowits region, the 200 kilometers

long, north-dipping paleoslope spanning northern Arizona and southern Utah would have had a relatively low gradient (average slope <0.1°). Consequently, the slope would be favorable for the development of a low-gradient, north-flowing distributive fluvial system (Hartley, 2010). This is consistent with paleoslope estimates of the Kaiparowits region from Pettinga (2012).

If this DFS extended into southern Utah and was responsible for deposition of Straight Cliffs Formation strata, the detrital zircon provenance signature would be almost entirely represented by Population C (1.25-1.90 Ga). Instead, Population C only accounts for 67% of all fluvial ages, and the remaining zircons were derived from the Sevier thrust belt and Cordilleran volcanic arc. Therefore, fluvial sediments in the Straight Cliffs Formation could not have been deposited exclusively within the Mogollon DFS. In order to sufficiently mix sediment from the Mogollon highlands, Sevier thrust belt, and Cordilleran volcanic arc, fluvial systems in southern Utah most likely consisted of axial rivers flowing northeast around the toe of the Mogollon DFS. This axial fluvial system was largely fed by the Mogollon DFS, but was also fed by smaller (<50 kilometers) and steeper (>0.1°, Edwards et al., 2005) DFSs flowing southeast from the Sevier thrust belt. These transverse rivers were shorter than the Mogollon DFS because increased accommodation rates adjacent to the Sevier thrust front restricted basinward progradation.

Tectonic Controls on Basin Subsidence, DFS Progradation, and Stratigraphic Architecture

The stratigraphic architecture of the Straight Cliffs Formation was heavily influenced by the interactions between the axial and transverse river systems draining the Mogollon highlands and Sevier thrust belt. Stratigraphic architectural trends in Straight Cliffs Formation Strata can be tied to variations in basin subsidence rates, sedimentation rates, and eustatic sea level, which in turn influenced basin accommodation rates and the progradation rates of transverse DFSs. Generally, the Straight Cliffs Formation can be subdivided into three stratigraphic intervals defined by architectural, compositional, and detrital zircon geochronologic trends. Each interval roughly coincides with the member stratigraphy and corresponds to synchronized trends in the variables mentioned above, which are driven by fluctuations in basin accommodation and sediment supply. These trends are summarized in Figures 19 and 20.

The distribution of axial and transverse drainages throughout the Cordilleran foreland basin was controlled by several factors, but appears to be most influenced by the interplay between subsidence rates and sediment supply. In southern Utah, the stratigraphic architecture of the axial dominated system was largely controlled by the basinward advancement of DFSs draining the Mogollon highlands and Sevier thrust belt, and the lengths of these DFSs were primarily governed by the availability of horizontal accommodation space (Hartley, 2010). In the case of high gradient DFSs draining the Sevier thrust belt, rapid subsidence adjacent to the thrust front significantly reduced the availability of horizontal accommodation space and restricted the areal extent of the DFSs. In contrast, rivers flowing north from the Mogollon highlands did not cross any

thrust fronts or regions of localized, rapid subsidence, which enabled them to traverse more than 200 kilometers across gradually subsiding crust in northern Arizona.

The relationship between subsidence rates and thrust belt activity remains unclear, but previous studies have suggested that increased subsidence rates in the foredeep region are related to active propagation of the thrust belt (Heller et al. 1988; Flemings and Jordan 1989), or conversely, periods of thrust belt quiescence (Talling et al. 1995; DeCelles and Giles 1996; Lawton, 2003). The former hypothesis proposes that increased subsidence rates are the result of increased loading in the thrust belt, causing downward flexure of the foreland basin. During periods of reduced thrust belt activity, isostatic rebound in the foreland basin reduces subsidence rates. The latter hypothesis suggests that the upward trajectory of thrust sheets beneath the foreland basin margin reduces subsidence, whereas a reduction in thrust front propagation enables the basin to subside more rapidly (DeCelles and Giles, 1996).

In the case of the Mogollon highlands and the Maria thrust belt, evidence suggests periods of uplift and active thrusting coincided with episodes of reduced foreland basin subsidence. During late Turonian time, active thrusting in the Maria thrust belt uplifted the Mogollon highlands (Salem, 2009) and adjacent foreland basin strata in northern Arizona. This regional uplift and tilting likely decreased subsidence rates in southern Utah, remobilized coarse-grained detritus in the proximal Mogollon DFS, and delivered it to the more distal reaches of the DFS and into the foreland basin. Estimates for the timing of initial thrusting in the Maria thrust belt (Knapp and Heizler, 1987, 1990) suggest deformation began at approximately 90 Ma. This is consistent with the rapid decrease in accommodation and increase in sedimentation that occurred during deposition of the

Tibbet Canyon Member, Smoky Hollow Member, and Calico bed (Figure 21A). Barth et al. (2004) estimate a significant reduction in Maria thrust belt activity at 86 Ma, which coincides with the increase in accommodation development during deposition of the lower John Henry Member (Figure 21B).

During Santonian time, activation of the Paxton thrust sheet (Figure 5) in the Sevier thrust belt (DeCelles and Coogan 2006) increased foreland basin subsidence rates, which enabled the axial fluvial system in the Kaiparowits basin to transition from highly amalgamated, coarse grained channel belts to stabilized, fine-grained, isolated channels. These high subsidence rates prevented DFSs draining the Sevier thrust belt from prograding eastward and contributing significant volumes of sediment into the axial fluvial system. Instead, the DFSs transporting sediment northward from the Mogollon highlands continued to be the dominant contributor of sediment into the axial system (Figure 21B).

In early Campanian time, the Paxton thrust sheet began to deform in duplex style (DeCelles and Coogan, 2006); as a result, the rapid vertical stacking of Mesozoic strata in the Paxton thrust sheet began to uplift the overlying proximal foreland basin strata, thereby reducing basin accommodation rates and enabling the DFSs to prograde eastward (Figure 21C). The influx of sediment from the Sevier thrust belt into the axial fluvial system caused channel systems to become highly amalgamated (upper John Henry Member) and eventually braided (Drip Tank Member). By mid-Campanian time, DFSs draining the Mogollon highlands and Sevier thrust belt were feeding the axial fluvial system in almost equal proportions, and the Kaiparowits basin was nearly buried beneath transverse fans prograding from the Sevier thrust belt (Schellenbach, 2013).

Although the timing of thrust belt activity and accommodation development appear to coincide, other factors cannot be disregarded. In general, the upsection trends in stratigraphic architecture show little convincing correlation to known eustatic sea level changes (Figure 20), implying eustacy was not a primary control on the evolution of fluvial and marine stratigraphy during this time. However, eustatic excursions at the Turonian-Coniacian boundary and in early Campanian time (Hardenbol et al., 1998; Miller et al., 2005) may have contributed to the reduction in accommodation during deposition of the Calico bed and Drip Tank Member (Shanley and McCabe, 1991). Additionally, the effects of climate change on sedimentation rates must also be considered. The increase in sedimentation from the Sevier thrust belt during the early Campanian would imply climatic warming through time, and subsequently, an increase in overall precipitation. However, several studies indicate the Santonian-Campanian climate in North America gradually cooled through time (Wolfe and Upchurch, 1987; Huber et al., 1995). A cooler climate would generally imply drier conditions through time and lower sedimentation rates in the Campanian, thus favoring tectonics as the primary driving force behind increasing sedimentation rates.

Figure 16 – Detrital zircon ages corresponding to shoreface, tidal, and fluvial facies. Pie charts show relative proportion of ages from each population. Fluvial ages are dominated by grains from Population C (63%), with a moderate presence of Population B (17%) and A (17%) zircons. Tidal samples show an increase in ages from Population B (26%), and decreases in Population A (9%). Marine samples record a more significant provenance shift, with Population B and increasing (40%) and Population C decreasing (45%).

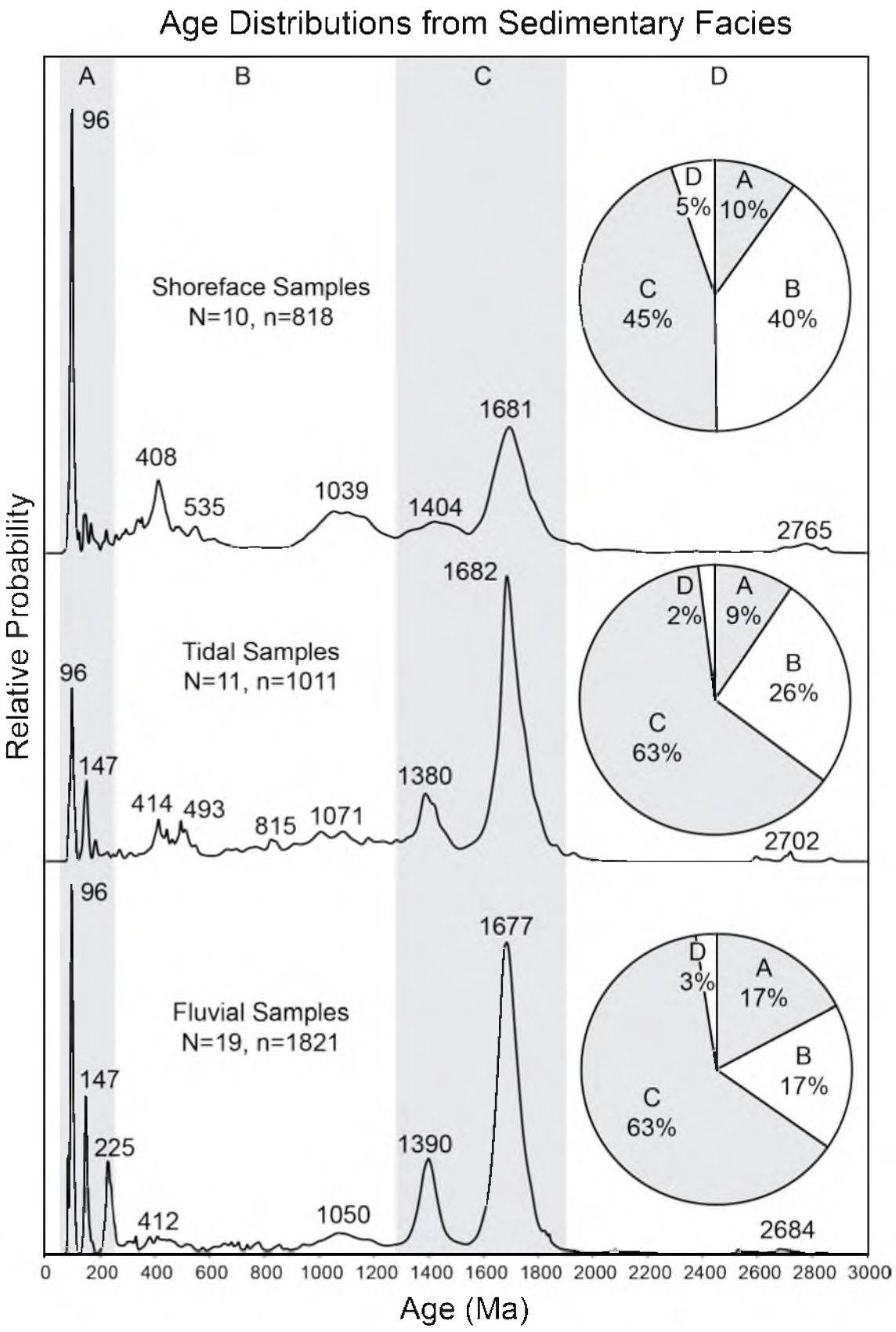

Age Distributions from Sedimentary Facies
A
B
C
D
96
408
535
1039
1404
1681
2765
Shoreface Samples
N=10, n=818
D 5%
A 10%
C 45%
B 40%
1682
96
147
414
493
815
1071
1380
2702
Tidal Samples
N=11, n=1011
D 2%
A 9%
B 26%
C 63%
96
147
225
412
1050
1390
1677
2684
Fluvial Samples
N=19, n=1821
D 3%
A 17%
B 17%
C 63%
Relative Probability
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000
Age (Ma)

Figure 17 – Relative proportions of each detrital zircon age population are plotted for each sample according to location and stratigraphic interval (Population D not shown due to relatively low percentages). Fluvial samples denoted by gray background shading. Samples generally show an upsection increase in Population C from the Tibbet Canyon Member (TCM) through the SHM (Smoky Hollow Member) to the Calico bed. At Heward Creek and Bull Canyon, Population C decreases through the John Henry Member (JHM) into the Drip Tank Member (DTM). Samples from Kelly Grade, Left Hand Collet, and Buck Hollow show an overall increase in Population C through the John Henry Member. In general, Populations B and C are inversely proportional to one another, and Population A shows a gradual upsection increase.

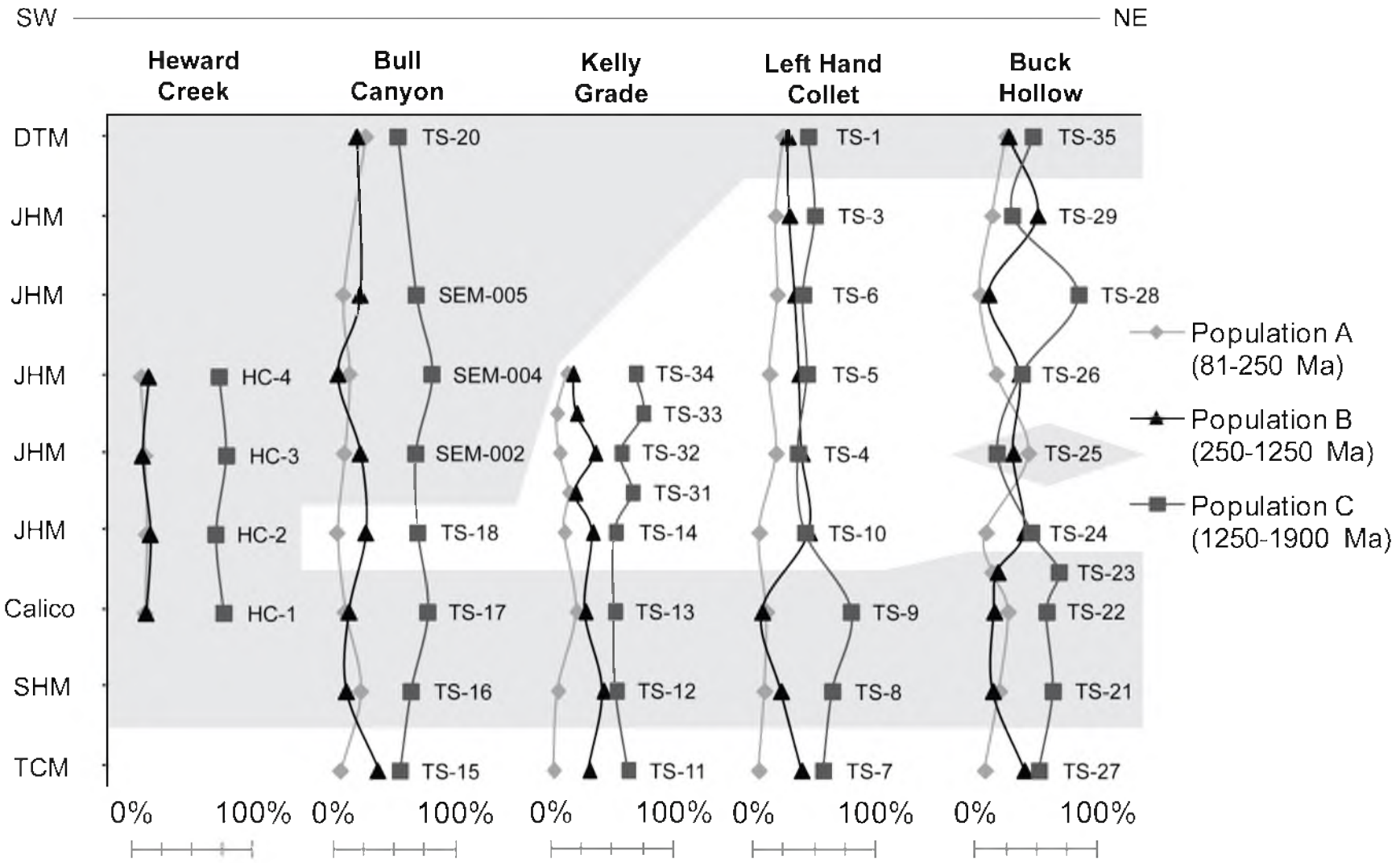

SW
NE
Heward Creek
Bull Canyon
Kelly Grade
Left Hand Collet
Buck Hollow
DTM
JHM
JHM
JHM
JHM
JHM
Calico
SHM
TCM
HC-4
HC-3
HC-2
HC-1
TS-20
SEM-005
SEM-004
SEM-002
TS-18
TS-17
TS-16
TS-15
TS-34
TS-33
TS-32
TS-31
TS-14
TS-13
TS-12
TS-11
TS-1
TS-3
TS-6
TS-5
TS-4
TS-10
TS-9
TS-8
TS-7
TS-35
TS-29
TS-28
TS-26
TS-25
TS-24
TS-23
TS-22
TS-21
TS-27
0%
100%
Population A (81-250 Ma)
Population B (250-1250 Ma)
Population C (1250-1900 Ma)

Figure 18 – Paleogeographic reconstruction of the Cordilleran foreland basin during Santonian time. Low gradient DFSs draining the Mogollon highlands fed an axial fluvial system flowing northeast through the Kaiparowits basin. High gradient DFSs draining the Sevier thrust belt also fed this axial system, but high subsidence rates adjacent to the thrust belt prevented these DFSs from prograding into the basin and contributing greater volumes of sediment into the axial fluvial system. Subordinate contributions of sediment from the Cordilleran volcanic arc also fed the axial fluvial system.

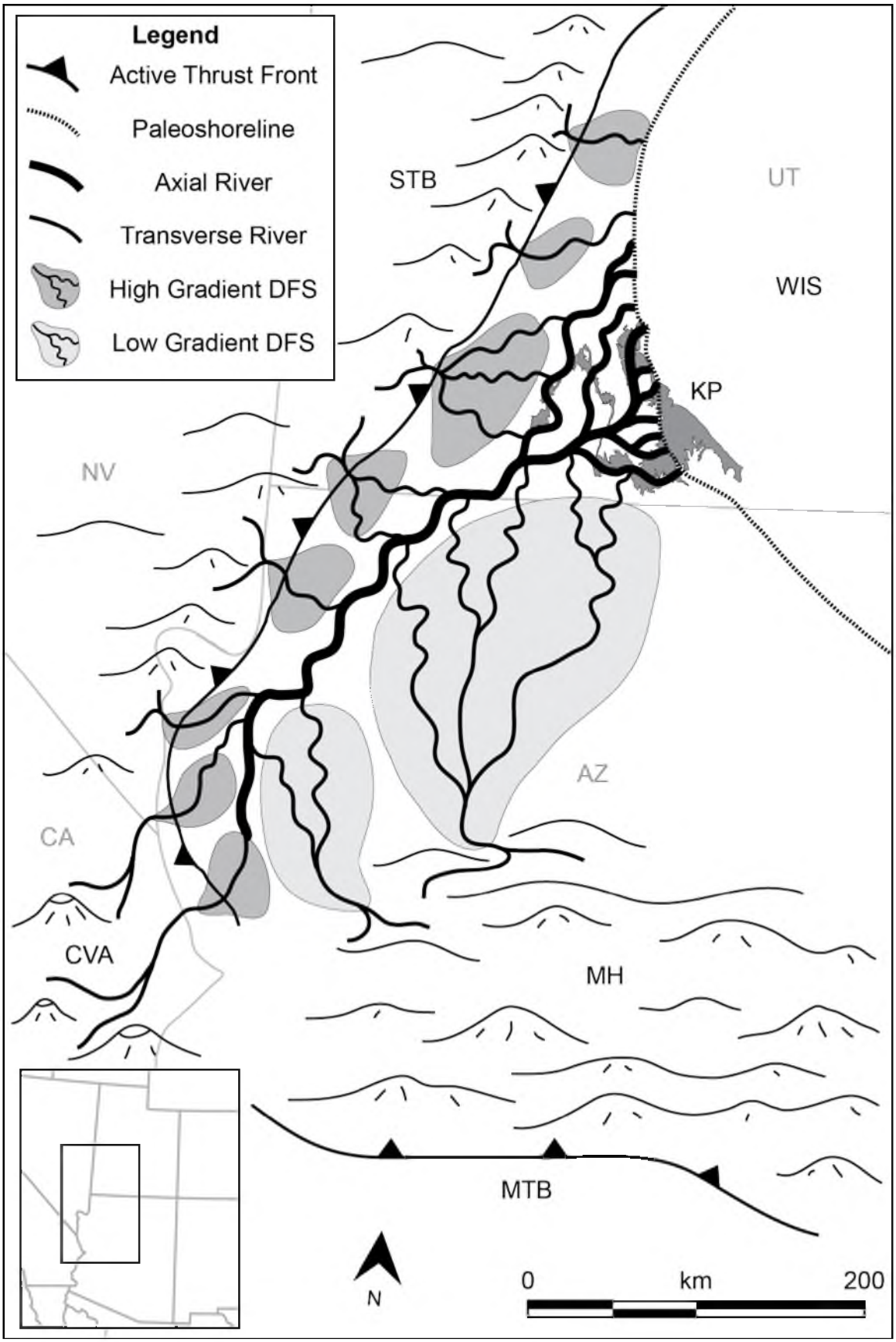

Legend
Active Thrust Front
Paleoshoreline
Axial River
Transverse River
High Gradient DFS
Low Gradient DFS
STB
UT
WIS
KP
NV
AZ
CA
CVA
MH
MTB
N
0
km
200

Figure 19 – Upsection trends in Straight Cliffs fluvial architecture, sandstone modal composition, and detrital zircon ages. Accommodation rates relative to sediment supply are inferred from trends observed in the preceding columns. The timing of major thrusting events in the Sevier thrust belt and Maria thrust belt are denoted by vertical bars in the rightmost column.

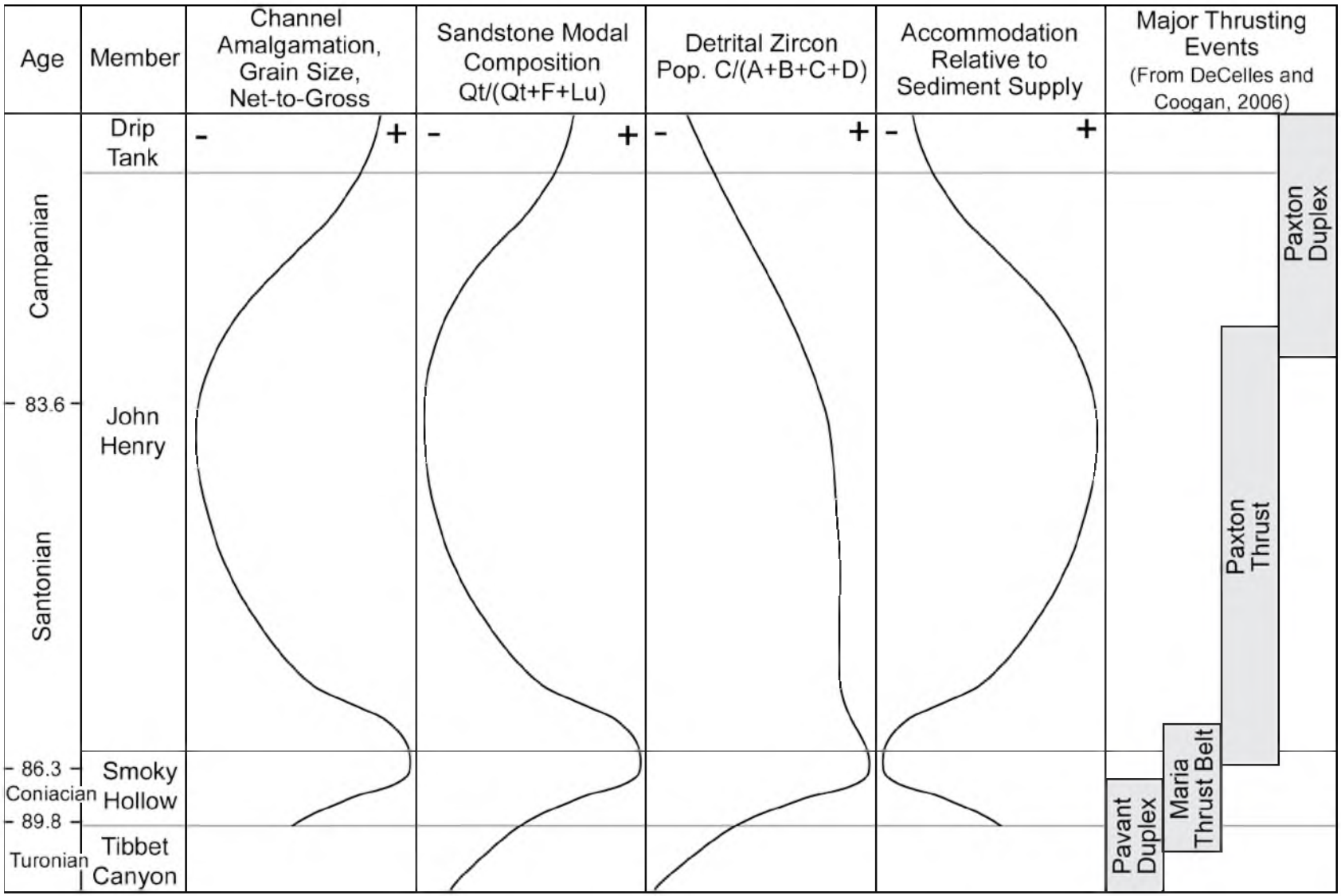

Age
Member
Channel Amalgamation, Grain Size, Net-to-Gross
Sandstone Modal Composition Qt/(Qt+F+Lu)
Detrital Zircon Pop. C/(A+B+C+D)
Accommodation Relative to Sediment Supply
Major Thrusting Events
(From DeCelles and Coogan, 2006)
Drip Tank
John Henry
Smoky Hollow
Tibbet Canyon
Campanian
Santonian
Coniacian
Turonian
83.6
86.3
89.8
- +
Paxton Duplex
Paxton Thrust
Maria Thrust Belt
Pavant Duplex

Figure 20 – Upsection trends in Straight Cliffs shoreline stacking patterns, sandstone modal composition, detrital zircon ages, accommodation rates versus sediment supply, and eustatic sea level (modified from Hardenbol et al., 1998 and Miller et al., 2005). Abbreviations – L: landward; B: basinward.

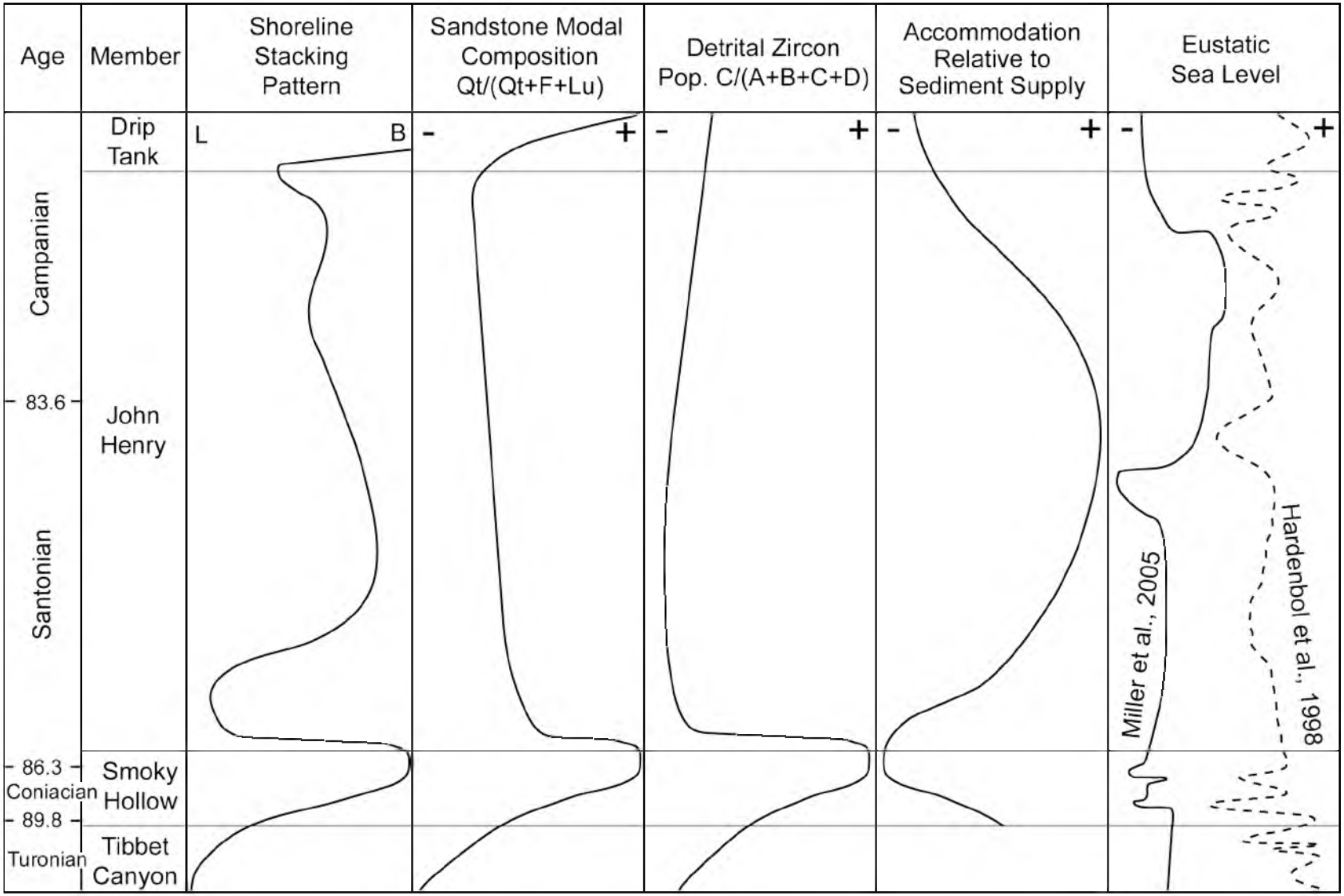
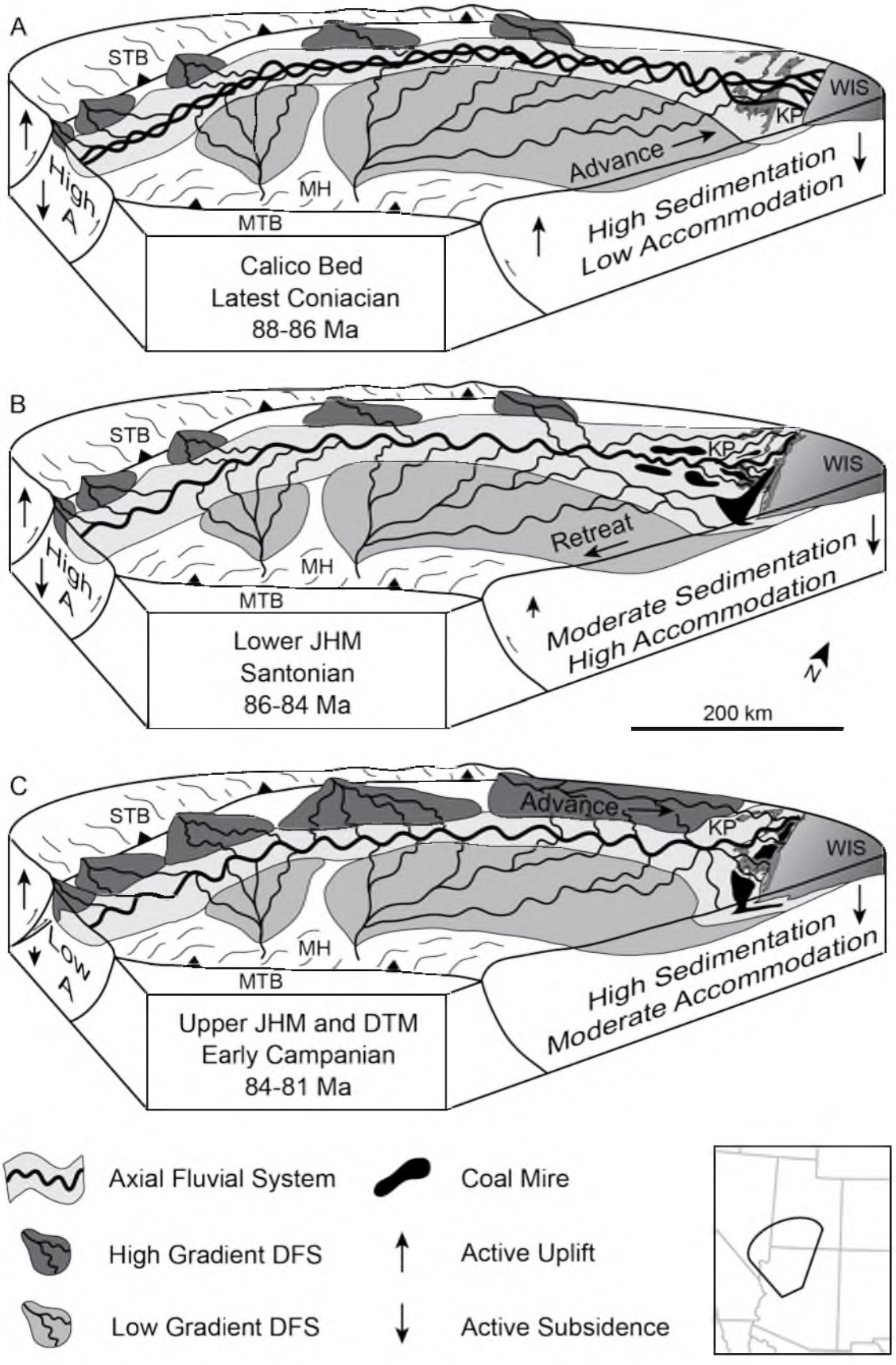

Age
Member
Shoreline Stacking Pattern
Sandstone Modal Composition Qt/(Qt+F+Lu)
Detrital Zircon Pop. C/(A+B+C+D)
Accommodation Relative to Sediment Supply
Eustatic Sea Level
Drip Tank
L
B
-
+
Campanian
Santonian
83.6
John Henry
86.3
Coniacian
Smoky Hollow
89.8
Turonian
Tibbet Canyon
Miller et al., 2005
Hardenbol et al., 1998

Figure 21 – Schematic representations of drainage network evolution in southern Utah and northern Arizona. (A) During Turonian-Coniacian time, uplift in the Mogollon highlands (MH) coincided with reduced subsidence rates in southern Utah and an increased influx of coarse-grained detritus into the foreland basin. Low accommodation enabled low gradient DFSs draining the Mogollon highlands to prograde northward, where they fed the northeast flowing axial fluvial system. Axial fluvial deposits are highly amalgamated and entered the Western Interior Seaway (WIS) basinward of the Kaiparowits Plateau (KP). These axial fluvial sandstones record deposition of the Calico bed. Subsidence rates adjacent to the Sevier thrust belt (STB) remained high throughout this interval, preventing high gradient DFSs from advancing into the basin and supplying significant volumes of sediment into the axial fluvial system. (B) Santonian strata of the lower John Henry Member record evidence for increased accommodation in southern Utah as uplift of the Mogollon highlands temporarily slowed and the Paxton thrust sheet began to activate in the Sevier thrust belt. Low gradient DFSs draining the Mogollon highlands were pulled south, trapping coarse-grained detritus in the proximal regions of the DFSs and enabling only finer-grained material to enter the axial fluvial system. Increased accommodation and decreased sedimentation promoted the development of raised coal mires, which stabilized the axial fluvial system and prevented major avulsions from taking place. Continued subsidence adjacent to the Sevier thrust belt prevented high gradient DFSs from advancing eastward. (C) During early Campanian time, reduced accommodation in the Kaiparowits basin and adjacent to the Sevier thrust belt resulted in the basinward progradation of DFSs draining the Mogollon highlands and Sevier thrust belt. This decrease in accommodation was likely driven by development of the Paxton duplex beneath proximal foreland basin strata. The additional influx of sediment from the Sevier thrust belt, coupled with reduced accommodation in southern Utah, resulted in increased channel belt amalgamation and grain sizes. Abbreviations - MTB: Maria thrust belt; TCM: Tibbet Canyon Member; SHM: Smoky Hollow Member; JHM: John Henry Member; DTM: Drip Tank Member; Low/High A: Low/High Accommodation.


A
STB
WIS
KP
Advance
High
A
MH
MTB
High Sedimentation
Low Accommodation
Calico Bed
Latest Coniacian
88-86 Ma
B
STB
KP
WIS
Retreat
High
A
MH
MTB
Moderate Sedimentation
High Accommodation
Lower JHM
Santonian
86-84 Ma
N
200 km
C
STB
Advance
KP
WIS
Low
A
MH
MTB
High Sedimentation
Moderate Accommodation
Upper JHM and DTM
Early Campanian
84-81 Ma
Axial Fluvial System
Coal Mire
High Gradient DFS
Active Uplift
Low Gradient DFS
Active Subsidence

CONCLUSIONS

Detrital zircon geochronological data from the Turonian-Campanian Straight Cliffs Formation of southern Utah provide insight into the interactions between axial and transverse drainage systems in the Cordilleran foreland basin. The abundance of Proterozoic zircons (1.25-1.90 Ga, 67% of all fluvial ages), northeast-directed paleocurrent indicators, and feldspatholithic sandstones in fluvial strata implies Yavapai-Mazatzal intrusive bodies in the Mogollon highlands of central Arizona were actively feeding river systems in the Kaiparowits basin. Phanerozoic and Grenville zircons are also present in Straight Cliffs fluvial sandstones (17%), and provide evidence for additional sediment input from the Sevier thrust belt in southwestern Utah. Subordinate Mesozoic zircons (16%) signal a minor influx of sediment from the Cordilleran volcanic arc or reworked volcanic material from Mesozoic sedimentary rocks in the Sevier thrust belt and Mogollon highlands.

Because fluvial sandstones contain detrital zircons from multiple source regions, a single distributive fluvial system draining either of these source terranes could not have been responsible for the deposition of Straight Cliffs fluvial strata by itself. Instead, sediment transported into southern Utah by DFSs must have been mixed together in an axial fluvial system flowing parallel to the strike of the Sevier thrust belt and adjacent to the Sevier and Mogollon DFSs. The sedimentology of Straight Cliffs fluvial strata is consistent with an axial fluvial system being fed by multiple DFS. During periods of

reduced accommodation development in the foreland basin, coarse-grained detritus was transported basinward in the prograding DFSs. This increased influx of coarse-grained detritus into the axial fluvial system resulted in the deposition of coarse-grained, highly amalgamated braided fluvial channels in the Kaiparowits basin (late Coniacian Calico bed, early Campanian Drip Tank Member). Fine-grained and unstable lithic material was preserved further east in the basin where the marine influence enhanced the development of accommodation space and preservation potential of this material. Marine strata show an increase in unstable lithic material relative to fluvial strata, and the detrital zircon age signatures of fluvial samples indicate longshore drift transported additional sediment from the Sevier thrust belt into the Kaiparowits basin.

During periods of increased accommodation rates throughout the Kaiparowits basin, coarse-grained detritus was deposited in the distributive fluvial systems draining the Mogollon highlands and Sevier thrust belt. Only the finer-grained material was transported into the axial fluvial system. Increased accommodation rates enabled the axial fluvial systems to stabilize within raised coal mires that developed along the river banks, estuaries, and inboard of the beaches. The increase in base level decreased the overall gradient of the axial fluvial system, ultimately causing it to bifurcate into an abundance of isolated fluvial channels that emptied into estuaries and lagoons. A larger trunk river may have reached the paleoshoreline, although direct evidence for such a river has not yet been identified.

The driving forces behind the variations in basin accommodation rates show a close relationship with tectonic activity in the Mogollon highlands and Sevier thrust belt, and are only weakly tied to eustacy. Amalgamated fluvial strata of the upper Smoky

Hollow and lower John Henry Members were deposited during a period of increased tectonic activity in the Maria thrust belt of central Arizona (Knapp and Heizler, 1987, 1990; Salem, 2009). Resultant uplift of the Mogollon highlands increased sedimentation rates from this source and may have reduced subsidence rates in the foreland basin, ultimately enabling the Mogollon DFS to prograde toward (but not completely into) to the Kaiparowits basin. Activity in both the Maria thrust belt declined during early Santonian time (Barth et al., 2004) when the Paxton thrust sheet began to activate in the Sevier thrust belt. (DeCelles and Coogan, 2006). These factors may account for the increase in foreland basin subsidence and accommodation rates. During early Campanian time, duplex style deformation of the Paxton thrust sheet uplifted proximal foreland basin strata and reduced accommodation rates adjacent to the Sevier thrust front (DeCelles and Coogan, 2006). As a result, DFSs draining the Sevier thrust belt were able to prograde further into the foreland basin, which is consistent with the upsection increase in Phanerozoic and Grenville zircons in the upper John Henry and Drip Tank Members.

APPENDIX

DETRITAL ZIRCON ISOTOPIC DATA

Raw isotopic data from all detrital zircon geochronologic analyses. Samples are organized by location, and analyses are arranged according to "Best Age." Analyses that have been corrected for common Pb are presented with corrected isotope ratios, and raw ratios are not included. Discarded analyses are not presented.

Table A.1
Detrital Zircon Isotopic Data

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	+(%)	206Pb/ 238U	+(%)	207Pb/ 206Pb Age	+(Ma)	206Pb/ 238U Age	+(Ma)	Best Age (Ma)	+(Ma)	Discordance (%)
HC-1	69	57	0.0650	16.9	0.1230	17.1	0.0137	6.6	1380	180	87.5	5.7	87.5	5.7	93.7
HC-1	73	318	0.0467	9.0	0.0969	3.1	0.0149	3.0	54	15	95.4	2.6	95.4	2.6	-76.3
HC-1	52	101	0.1180	11.9	0.1553	2.4	0.0238	2.5	6.7	3.6	113.4	4.2	113.4	4.2	-1411.9
HC-1	38	838	0.0486	5.1	6.5500	11.5	0.3730	7.0	66	27	147.4	3	147.4	3	-123.0
HC-1	2	139	0.0482	9.5	0.1016	3.5	0.0159	3.8	38	26	149.4	4.8	149.4	4.8	-292.6
HC-1	44	376	0.0491	5.5	0.1516	3.2	0.0233	3.4	41	18	152.9	3.7	152.9	3.7	-270.5
HC-1	107	218	0.0511	7.6	0.1650	7.3	0.0241	2.9	474	75	153.7	4.4	153.7	4.4	67.6
HC-1	30	1065	0.0512	4.7	0.2412	5.4	0.0341	2.1	318	48	216.1	4.4	216.1	4.4	32.0
HC-1	91	3067	0.0503	4.0	0.2476	4.8	0.0355	1.9	259	38	225	4.2	225	4.2	13.1
HC-1	98	6080	0.0511	3.7	0.2478	4.4	0.0357	1.9	250	35	225.8	4.2	225.8	4.2	9.7
HC-1	42	394	0.0467	7.1	0.2540	7.1	0.0372	2.4	381	66	235.4	5.5	235.4	5.5	38.2
HC-1	13	776	0.1028	3.2	0.3050	11.8	0.0424	9.2	189	150	284	25	284	25	-41.3
HC-1	99	3184	0.0755	5.3	4.2140	4.5	0.3012	1.8	296.7	160	296.7	120	296.7	120	2.9
HC-1	110	1021	0.0992	3.1	4.3800	6.6	0.3020	4.6	231	110	313	10	313	10	-27.3
HC-1	60	59950	0.0968	3.3	1.1970	15.0	0.0890	13.5	1561	45	549	68	549	68	64.8
HC-1	34	2335	0.0904	3.1	4.1950	8.1	0.2889	5.9	576	110	576	23	576	23	3.6
HC-1	33	1730	0.0981	3.2	4.2300	4.5	0.2980	1.8	535	230	599	58	599	58	-6.2
HC-1	49	10415	0.0971	3.1	4.7960	4.2	0.3198	1.8	875	150	869	28	875	150	3.8
HC-1	45	2625	0.1056	3.5	4.5770	6.6	0.3097	4.5	983	220	983	69	983	220	4.0
HC-1	62	3942	0.0730	3.4	1.7010	4.1	0.1674	1.7	1008	31	998	16	1008	31	1.0
HC-1	64	14727	0.1016	3.1	3.5200	8.8	0.2492	2.4	1041	150	1051	38	1041	150	2.4
HC-1	8	5167	0.0749	3.3	11.4700	4.8	0.4900	1.8	1065	66	1071	22	1065	66	-0.6
HC-1	66	47800	0.0752	3.2	1.9030	4.0	0.1825	1.8	1073	40	1080.5	17	1073	40	-0.7
HC-1	87	7788	0.0766	3.4	4.0280	4.5	0.2803	1.8	1098	56	1086	18	1098	56	1.1
HC-1	5	10271	0.1014	3.3	3.7230	5.1	0.2655	3.0	1324	210	1244	71	1324	210	7.2
HC-1	3	4126	0.0881	3.5	2.8010	4.3	0.2359	1.9	1377	35	1365	23	1377	35	0.9
HC-1	18	9753	0.0882	3.2	2.9200	4.1	0.2411	1.7	1379	42	1392.1	22	1379	42	-0.9
HC-1	118	27300	0.0892	3.6	0.3295	100.2	0.0457	46.0	1395	71	1489	29	1395	71	-6.4
HC-1	51	22500	0.0887	3.3	2.9660	4.0	0.2410	1.7	1397	37	1391.9	22	1397	37	0.4
HC-1	106	22078	0.0895	3.1	0.8950	7.8	0.1042	4.4	1416	42	1317.7	22	1416	42	7.0
HC-1	119	17850	0.0889	3.4	2.9250	4.1	0.2403	1.9	1417	43	1389	24	1417	43	2.0
HC-1	90	20320	0.0893	3.2	2.9720	4.0	0.2416	1.8	1417	36	1395.1	22	1417	36	1.5
HC-1	104	1688	0.0893	3.5	4.0610	4.4	0.2911	1.8	1419	60	1409	24	1419	60	0.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-1	103	3082	0.0902	3.2	3.0100	4.7	0.2450	2.5	1422	37	1412	31	1422	37	0.7
HC-1	109	9990	0.0893	3.5	2.9840	4.4	0.2450	1.8	1428	41	1413	23	1428	41	1.1
HC-1	46	1041	0.1147	3.2	4.6210	3.9	0.3137	1.8	1436	100	1183	20	1436	100	19.8
HC-1	79	1945	0.1063	3.3	4.2170	6.4	0.2961	3.0	1517	130	1395	41	1517	130	8.7
HC-1	54	14814	0.0985	3.1	0.2890	11.8	0.0403	6.7	1603	40	1620.9	26	1603	40	-1.0
HC-1	75	15420	0.0997	3.3	4.7920	4.4	0.3186	1.9	1617	52	1603	25	1617	52	0.9
HC-1	37	5139	0.0997	3.4	3.8870	4.4	0.2823	1.8	1620	37	1603	26	1620	37	1.0
HC-1	36	299	0.1014	3.8	4.0400	5.0	0.2957	2.3	1626	49	1669	34	1626	49	-2.6
HC-1	71	16500	0.1012	3.1	3.6600	8.7	0.2546	3.9	1635	110	1637	41	1635	110	-0.1
HC-1	32	32800	0.1008	3.4	4.2750	4.2	0.3066	1.8	1640	39	1724	27	1640	39	-5.1
HC-1	59	80920	0.1020	3.1	3.9420	4.3	0.2758	1.9	1648	64	1267	51	1648	64	23.1
HC-1	17	16953	0.1029	3.3	4.0100	5.7	0.2891	2.9	1648	280	1553	86	1648	280	5.8
HC-1	1	3453	0.1016	3.3	4.1030	4.1	0.2970	1.9	1649	39	1676	28	1649	39	-1.6
HC-1	53	5344	0.1015	3.3	3.1800	9.7	0.2402	3.5	1651	39	1727	27	1651	39	-4.6
HC-1	14	8147	0.1013	3.3	3.1940	5.6	0.2590	2.3	1652.3	61	1688	39	1652.3	61	-2.2
HC-1	80	5330	0.1013	5.1	4.2400	5.7	0.3056	2.7	1653	50	1717	41	1653	50	-3.9
HC-1	21	2245	0.1013	3.3	0.7500	14.7	0.0940	9.7	1656	51	1695	26	1656	51	-2.5
HC-1	41	26400	0.1045	3.3	4.3560	4.1	0.3028	1.9	1659	120	1443	28	1659	120	13.6
HC-1	67	35700	0.1017	3.2	4.2090	4.0	0.2986	1.8	1660	33	1684	26	1660	33	-1.4
HC-1	65	2652	0.1017	3.2	4.1560	4.1	0.2927	1.9	1661	29	1654	28	1661	29	0.4
HC-1	27	5238	0.1018	3.3	4.1420	4.1	0.2957	1.9	1662	36	1670	27	1662	36	-0.5
HC-1	23	4783	0.1019	3.2	3.9880	4.3	0.2875	2.0	1663	34	1629	29	1663	34	2.0
HC-1	55	6159	0.1022	3.1	4.5280	4.4	0.3104	2.0	1663	82	1655	34	1663	82	0.6
HC-1	94	6750	0.1021	3.2	3.9700	4.0	0.2834	1.9	1665	30	1609	28	1665	30	3.4
HC-1	111	350000	0.1029	3.1	1.3330	7.0	0.1398	3.6	1670.5	45	1680	30	1670.5	45	-0.8
HC-1	86	25457	0.1021	3.1	1.9250	4.1	0.1834	1.8	1675	89	1514	40	1675	89	9.3
HC-1	85	6925	0.1029	3.3	4.2730	4.2	0.3012	1.7	1676	35	1697	27	1676	35	-1.3
HC-1	58	49325	0.1031	3.1	4.2040	4.5	0.2962	3.3	1676.6	34	1672	49	1676.6	34	0.3
HC-1	77	350000	0.1026	3.2	4.3420	5.3	0.3031	2.1	1678	37	1689	26	1678	37	-0.7
HC-1	76	25820	0.1035	3.6	4.2820	4.4	0.2967	1.9	1681	32	1675	28	1681	32	0.4
HC-1	31	5371	0.1031	3.2	1.4330	11.2	0.1466	5.5	1681	120	1668	43	1681	120	0.6
HC-1	116	8145	0.1032	3.2	3.7300	8.8	0.2723	6.2	1681	42	1519.3	26	1681	42	9.7
HC-1	50	14214	0.1030	3.2	1.7660	7.4	0.1711	4.1	1682	36	1666	25	1682	36	1.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-1	6	22420	0.1037	3.2	4.1680	4.8	0.2944	1.9	1688	39	1678	27	1688	39	0.4
HC-1	108	11014	0.1038	3.2	4.1710	4.1	0.2946	1.8	1689	38	1664.2	26	1689	38	1.5
HC-1	115	4209	0.1036	3.3	4.2740	4.2	0.3028	1.8	1690	33	1705	27	1690	33	-0.9
HC-1	74	3746	0.1032	3.3	4.2020	4.0	0.2995	1.7	1690	43	1702	28	1690	43	-0.9
HC-1	56	12463	0.1023	3.6	3.9710	3.5	0.2723	2.4	1693	46	1639	26	1693	46	3.1
HC-1	43	21660	0.1041	3.2	4.4080	4.1	0.3057	1.7	1694.4	33	1719	26	1694.4	33	-1.5
HC-1	7	3675	0.1041	3.2	4.1680	4.8	0.2896	1.9	1695	38	1645	27	1695	38	3.1
HC-1	39	147700	0.1045	3.1	4.1820	4.1	0.2950	1.7	1699	480	1636	91	1699	480	3.7
HC-1	100	9189	0.1037	3.4	4.3240	4.2	0.3027	1.9	1699	49	1661	26	1699	49	2.1
HC-1	120	11480	0.1034	3.2	3.8690	4.1	0.2823	1.8	1700	43	1570	27	1700	43	7.6
HC-1	70	3783	0.1034	3.1	4.3280	8.1	0.3019	4.0	1701	84	1692	67	1701	84	0.4
HC-1	16	11467	0.1040	3.2	4.1560	4.1	0.2903	1.9	1702	48	1704	27	1702	48	-0.1
HC-1	92	2056	0.1043	3.5	4.2070	3.8	0.2985	2.0	1702	66	1686	27	1702	66	1.0
HC-1	22	20586	0.1050	3.3	4.1670	6.7	0.2996	2.8	1712	140	1699	59	1712	140	0.7
HC-1	102	2863	0.1045	3.6	4.3330	4.4	0.3030	2.0	1713	37	1706	30	1713	37	0.4
HC-1	84	1554	0.1045	3.5	4.2900	4.4	0.2964	3.7	1716	45	1673	56	1716	45	2.5
HC-1	81	8667	0.1046	3.3	3.9020	4.1	0.2856	1.8	1719	43	1592	26	1719	43	7.4
HC-1	40	9567	0.1050	3.3	4.2970	4.2	0.2968	1.9	1720	35	1675	28	1720	35	2.6
HC-1	10	19800	0.1051	3.3	4.1870	4.8	0.2969	2.0	1720	45	1742	30	1720	45	-1.3
HC-1	25	3546	0.1036	3.4	4.1300	4.8	0.2871	2.5	1721	51	1642	26	1721	51	4.8
HC-1	97	6489	0.1051	3.3	4.3040	4.2	0.2981	2.0	1723	29	1681	30	1723	29	2.4
HC-1	57	350000	0.1064	3.4	1.5800	8.2	0.1580	7.0	1732	57	1704	30	1732	57	1.5
HC-1	78	26417	0.1061	3.1	4.2720	5.4	0.2988	1.9	1732.4	34	1759.3	27	1732.4	34	-1.5
HC-1	35	6856	0.1064	3.1	4.5560	4.2	0.3109	2.1	1735	40	1745	32	1735	40	-0.6
HC-1	28	7625	0.1048	3.4	4.5700	5.9	0.3080	2.3	1735	220	1460	49	1735	220	15.7
HC-1	114	5000	0.1056	3.1	4.2000	4.5	0.2918	3.4	1736	37	1650	51	1736	37	5.0
HC-1	11	24300	0.1057	3.1	4.1260	3.6	0.2898	1.8	1739	67	1549	33	1739	67	10.8
HC-1	26	7100	0.1051	3.3	0.7360	5.7	0.0899	4.1	1740	61	1730	34	1740	61	0.6
HC-1	112	16433	0.1065	3.4	4.4970	4.2	0.3082	1.8	1742	31	1732	28	1742	31	0.6
HC-1	105	6003	0.1072	3.5	4.5690	4.2	0.3131	1.8	1743	38	1756	28	1743	38	-0.7
HC-1	113	3385	0.1071	3.3	4.6620	4.1	0.3173	1.9	1755	32	1776	29	1755	32	-1.2
HC-1	20	13373	0.1074	3.4	4.6240	4.1	0.3120	1.8	1759	32	1750	28	1759	32	0.5
HC-1	72	30550	0.1071	3.4	3.7690	4.8	0.2656	1.9	1766	140	1737	70	1766	140	1.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-1	93	10900	0.1083	3.2	4.1420	4.1	0.2923	2.3	1767	42	1784	28	1767	42	-0.9
HC-1	68	40750	0.1082	3.2	1.8530	5.9	0.1808	2.3	1773	46	1789	28	1773	46	-0.8
HC-1	117	2679	0.1107	3.3	4.7620	4.2	0.3131	1.8	1814	32	1756	28	1814	32	3.2
HC-1	96	5495	0.1130	3.5	5.1400	4.3	0.3309	1.9	1849	41	1842	31	1849	41	0.4
HC-1	9	6000	0.1046	3.2	0.1508	2.1	0.0231	2.4	1682	69	1873	39	1873	39	-11.4
HC-1	12	5793	0.1700	3.2	4.2690	4.2	0.3072	1.9	2568.9	32	2576	38	2568.9	32	-0.1
HC-2	108	2150	0.0463	0.4	0.1021	2.4	0.0160	2.8	14	8.4	2.4	502	102.7	2.4	-628.6
HC-2	94	1875	0.0486	1.7	0.1458	2.2	0.0224	2.2	126	35	2.9	549	145	2.9	-13.3
HC-2	18	538	0.0469	1.3	0.1437	2.1	0.0226	2.4	34	25	3.2	550	146	3.2	-323.8
HC-2	66	853	0.0472	0.8	0.1539	1.9	0.0233	2.4	55	18	3.3	322	149.2	3.3	-170.4
HC-2	52	3481	0.0522	3.3	0.4160	4.3	0.0587	2.0	284	74	6.6	736	374.2	6.6	-29.5
HC-2	24	350000	0.0540	1.8	0.4840	2.1	0.0654	2.1	362	33	7.7	454	409.7	7.7	-12.8
HC-2	86	897	0.0541	2.4	0.5170	2.9	0.0693	2.0	366	57	7.8	510	434.1	7.8	-18.0
HC-2	47	2119	0.0561	2.5	0.5730	2.8	0.0745	2.0	477	50	8.6	849	470.9	8.6	2.9
HC-2	96	6342	0.0621	1.5	0.8420	1.8	0.0998	1.7	673	32	10	763	613.5	10	8.9
HC-2	88	578	0.0620	1.1	0.8750	2.7	0.1023	2.0	672.4	23	12	1919.9	672.4	12	6.6
HC-2	38	4138	0.0707	3.0	1.4880	5.3	0.1518	3.4	946	60	28	1644.3	946	28	3.8
HC-2	37	2494	0.0719	4.2	1.5620	7.7	0.1578	2.9	982	66	24	1667	980	24	3.9
HC-2	42	6187	0.0762	2.6	1.8950	3.8	0.1807	1.9	1101	39	19	1657.7	1103.4	19	2.7
HC-2	90	17235	0.0791	5.7	2.0900	6.7	0.1890	4.4	1158	110	43	1400.6	1123	43	4.0
HC-2	23	2093	0.0834	3.0	2.3900	5.9	0.2029	3.2	1270	57	32	1788	1270	57	6.4
HC-2	77	21652	0.0967	4.7	2.9500	6.1	0.2205	4.5	1538	95	51	1651	1288	51	16.5
HC-2	22	5044	0.0886	2.3	2.9890	3.1	0.2449	2.0	1398	43	23	1385	1398	43	-1.0
HC-2	60	1243	0.0887	2.0	2.9690	2.7	0.2416	1.8	1400	39	22	1394	1400	39	0.4
HC-2	110	2209	0.0889	1.5	2.9900	2.4	0.2438	1.7	1400	29	21	1394	1400	29	-0.5
HC-2	114	350000	0.0891	1.8	2.8970	2.7	0.2364	1.7	1404	35	21	1403	1404	35	2.6
HC-2	118	4555	0.0890	1.5	2.9420	2.4	0.2396	1.8	1405	28	21	1401	1405	28	1.5
HC-2	74	65667	0.0895	2.0	2.9940	4.3	0.2437	2.9	1417	35	35	1406	1417	35	0.8
HC-2	61	77200	0.0915	1.1	3.2320	2.2	0.2558	1.7	1456.4	21	22	1456.8	1456.4	21	-0.8
HC-2	91	20173	0.0983	1.3	3.7170	2.1	0.2749	1.6	1592.4	23	23	1595.4	1592.4	23	1.7
HC-2	62	23010	0.0983	2.8	4.0700	4.2	0.2982	2.0	1600	54	27	1641	1600	54	-5.4
HC-2	51	350000	0.0987	3.4	3.2300	5.0	0.2499	2.7	1601	63	30	1762	1601	63	10.2
HC-2	106	14478	0.1017	1.3	4.3040	2.3	0.3052	1.7	1653	24	25	1662	1653	24	-3.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-2	11	7811	0.1020	1.8	4.2630	2.3	0.3002	1.7	1661	32	25	1670	1661	32	-1.9
HC-2	14	2746	0.1024	2.1	4.2990	3.0	0.3000	2.0	1663	39	28	1681	1663	39	-1.7
HC-2	109	38160	0.1025	4.7	4.0890	3.2	0.2824	2.2	1667	85	31	1708.3	1667	85	3.9
HC-2	58	181500	0.1027	1.5	3.9620	2.4	0.2789	1.9	1673	27	27	1670.4	1673	27	5.3
HC-2	59	15100	0.1026	1.9	4.2730	2.8	0.3008	2.0	1673	34	28	1672	1673	34	-1.3
HC-2	6	350000	0.1031	2.2	4.3450	3.0	0.3043	1.8	1673	43	26	1691	1673	43	-2.5
HC-2	5	7173	0.1026	1.5	4.3660	2.2	0.3077	1.7	1673	28	25	1669.4	1673	28	-3.4
HC-2	65	51000	0.1030	7.9	3.9600	6.1	0.2770	4.3	1676	180	58	1679.6	1676	180	6.0
HC-2	67	16533	0.1033	1.5	4.2320	2.6	0.2970	1.8	1682	29	26	1681	1682	29	0.2
HC-2	16	15478	0.1032	1.5	4.3810	2.3	0.3079	1.8	1682	28	27	1692	1682	28	-2.9
HC-2	50	3278	0.1032	1.6	4.4170	2.5	0.3077	1.8	1682	28	26	1664	1682	28	-2.8
HC-2	3	3540	0.1023	2.4	3.8590	3.4	0.2734	2.1	1683	45	29	1710	1683	45	7.5
HC-2	116	28440	0.1036	1.2	4.3220	2.8	0.3022	2.0	1689	22	29	1688	1689	22	-0.8
HC-2	89	11918	0.1037	1.2	4.3720	2.2	0.3038	1.6	1690.8	22	25	1693.5	1690.8	22	-1.1
HC-2	44	1194	0.1043	2.3	4.0900	3.9	0.2836	2.2	1692	45	30	1685	1692	45	4.9
HC-2	32	350000	0.1036	3.5	4.1800	4.5	0.2934	2.3	1692	64	30	1672	1692	64	2.0
HC-2	7	8863	0.1038	1.3	4.3430	2.3	0.3040	1.7	1692	25	25	1683	1692	25	-1.1
HC-2	28	38550	0.1039	1.3	4.3220	2.5	0.3010	1.8	1693	24	27	1696	1693	24	-0.2
HC-2	71	6230	0.1036	2.1	4.3770	2.5	0.3034	1.7	1693	37	26	1694	1693	37	-0.9
HC-2	27	59400	0.1041	1.7	4.0440	3.0	0.2821	1.8	1695	31	25	1687	1695	31	5.5
HC-2	13	350000	0.1042	1.4	4.4340	2.5	0.3059	1.8	1698	27	27	1694	1698	27	-1.3
HC-2	113	12750	0.1044	2.5	4.3750	3.0	0.3003	2.2	1700	45	33	1679	1700	45	0.5
HC-2	79	61667	0.1043	1.3	4.3390	3.2	0.2989	2.4	1702	24	35	1694	1702	24	1.0
HC-2	99	2600	0.1044	1.5	4.4250	2.9	0.3046	1.8	1702	29	27	1702	1702	29	-0.7
HC-2	93	5350	0.1044	1.7	4.2600	2.3	0.2963	1.8	1705	34	26	1701	1705	34	1.9
HC-2	84	21869	0.1049	1.4	3.8990	2.2	0.2710	1.7	1711.1	26	23	1705	1711.1	26	9.6
HC-2	9	4344	0.1055	1.3	4.2640	2.2	0.2960	1.8	1720	25	25	1718	1720	25	2.8
HC-2	1	63467	0.1056	1.0	4.6070	2.2	0.3160	1.6	1724.7	18	25	1723.2	1724.7	18	-2.6
HC-2	111	8095	0.1061	1.9	4.7630	2.9	0.3259	2.2	1732.8	34	34	1733.2	1732.8	34	-4.9
HC-2	25	350000	0.1062	1.5	4.6690	2.6	0.3176	1.7	1733	28	26	1734	1733	28	-2.6
HC-2	107	4745	0.1067	2.1	4.3150	2.8	0.2938	1.7	1741	34	26	1722	1741	34	4.6
HC-2	78	34825	0.1079	1.6	4.7360	2.3	0.3182	1.8	1763	30	27	1760.2	1763	30	-1.0
HC-2	55	11598	0.1702	1.9	10.9900	2.7	0.4689	1.8	2558	33	37	2567	2558	33	3.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-2	4	8160	0.1832	1.4	12.6390	2.4	0.5024	1.7	2681.6	23	36	2681.3	2681.6	23	2.1
HC-3	70	2464	0.0475	3.8	0.0853	3.6	0.0131	2.7	205	42	84	2.2	84	2.2	59.0
HC-3	58	165	0.0483	14.3	0.0910	4.2	0.0143	4.8	8.2	8	91.6	4	91.6	4	85.9
HC-3	23	479	0.0509	9.2	0.1034	8.5	0.0147	3.4	456	81	94.3	3.2	94.3	3.2	79.3
HC-3	116	1245	0.0510	9.6	0.0936	3.0	0.0147	3.9	11	11	95	3.2	95	3.2	85.4
HC-3	108	943	0.0482	10.8	0.0981	9.8	0.0150	3.8	620	120	95.6	3.6	95.6	3.6	84.6
HC-3	25	176	0.0587	12.3	0.0947	4.9	0.0150	5.2	6.5	5.4	97.8	4.6	97.8	4.6	87.1
HC-3	46	224	0.0497	6.8	0.1053	2.6	0.0163	3.6	24	13	105.2	3.3	105.2	3.3	71.4
HC-3	62	1493	0.0525	5.3	0.1650	5.0	0.0229	2.8	366	60	145.7	4	145.7	4	60.2
HC-3	37	208	0.0511	6.5	0.1506	2.4	0.0232	3.1	33	20	148.9	4.3	148.9	4.3	63.0
HC-3	5	333	0.0500	10.4	0.1560	9.6	0.0235	3.5	590	110	149.4	5.2	149.4	5.2	74.7
HC-3	71	1357	0.0638	3.3	0.1515	2.4	0.0234	2.9	27	20	152.4	4.1	152.4	4.1	79.7
HC-3	64	1343	0.0497	4.4	0.1760	1.8	0.0271	2.6	64	29	173	4.3	173	4.3	41.2
HC-3	16	7365	0.0502	4.0	0.2897	2.5	0.0429	2.8	130	37	269.9	6.9	269.9	6.9	-1.8
HC-3	65	1388	0.0550	4.5	0.5140	4.1	0.0689	2.6	428	50	429.7	11	429.7	11	-0.4
HC-3	43	2895	0.0584	3.6	0.7260	3.4	0.0893	2.5	568	44	551.4	13	568	44	2.9
HC-3	110	4965	0.0900	3.3	1.6020	4.1	0.1654	2.8	991	86	1007	25	991	86	28.7
HC-3	119	2804	0.0756	3.6	1.9090	3.1	0.1832	2.5	1096	44	1084	25	1096	44	1.1
HC-3	61	1945	0.0758	2.9	1.8730	2.9	0.1810	2.4	1111	45	1074	24	1111	45	3.3
HC-3	104	2427	0.0780	3.3	2.1260	3.0	0.1985	2.6	1146	37	1169	27	1146	37	-2.0
HC-3	35	7900	0.0782	2.6	2.1930	2.3	0.2034	2.4	1160	36	1194	26	1160	36	-2.9
HC-3	112	9401	0.0791	2.5	2.0770	2.3	0.1922	2.3	1164	31	1133.3	24	1164	31	2.6
HC-3	111	2123	0.1157	2.8	2.4820	2.1	0.2141	2.7	1296.6	16	1296.6	28	1296.6	16	31.3
HC-3	50	22900	0.0894	2.5	2.8530	2.5	0.2318	2.5	1413	28	1344	30	1413	28	4.9
HC-3	51	2070	0.0890	3.0	2.8580	2.9	0.2352	2.5	1414	38	1361	30	1414	38	3.7
HC-3	91	2913	0.0939	3.1	3.3800	4.4	0.2642	3.0	1480	79	1511	34	1480	79	-0.9
HC-3	114	2591	0.1016	2.7	3.6700	4.4	0.2703	3.3	1614	56	1546	44	1614	56	6.2
HC-3	15	1280	0.1014	3.5	4.0800	3.7	0.2956	2.8	1617	65	1673	39	1617	65	-1.6
HC-3	95	4117	0.1007	2.9	4.2040	2.6	0.3019	2.5	1638	29	1700	37	1638	29	-3.8
HC-3	39	39150	0.1011	2.6	4.3320	2.5	0.3068	2.5	1647	32	1723	36	1647	32	-4.7
HC-3	80	6600	0.1021	2.5	4.2190	2.4	0.3034	2.3	1652	30	1706	36	1652	30	-2.5
HC-3	28	63300	0.1019	2.5	4.2400	2.3	0.3024	2.5	1658	35	1704	35	1658	35	-2.9
HC-3	47	9277	0.1018	2.7	4.1020	2.7	0.2944	2.5	1659	31	1662	36	1659	31	-0.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-3	69	72600	0.1018	2.4	4.1650	2.2	0.2967	2.3	1660	28	1675	34	1660	28	-0.9
HC-3	103	11025	0.1023	2.5	4.2430	2.4	0.3010	2.4	1661	24	1696	36	1661	24	-2.1
HC-3	81	1601	0.1015	3.1	4.1930	2.9	0.2976	2.4	1668	29	1679	36	1668	29	-0.7
HC-3	109	3350	0.1015	3.3	4.2550	2.8	0.3041	2.5	1670	30	1714	37	1670	30	-2.6
HC-3	19	59850	0.1026	2.3	4.1900	2.1	0.2973	2.3	1671.6	29	1676.9	34	1671.6	29	-0.4
HC-3	120	4909	0.1035	2.4	4.2680	2.1	0.3018	2.3	1674	26	1700	35	1674	26	-1.6
HC-3	102	8048	0.1028	2.6	4.2040	2.4	0.2981	2.4	1674	28	1682	36	1674	28	-0.5
HC-3	12	5742	0.1027	2.4	4.1220	2.1	0.2921	2.3	1676	28	1652.1	33	1676	28	1.2
HC-3	78	2971	0.1037	2.7	4.4000	2.5	0.3079	2.5	1677	21	1736	38	1677	21	-3.5
HC-3	72	129600	0.1029	2.4	4.2790	2.3	0.3014	2.4	1677	27	1698	35	1677	27	-1.4
HC-3	59	37700	0.1031	2.4	4.2050	2.2	0.2977	2.4	1678	24	1680.5	34	1678	24	0.2
HC-3	48	3168	0.1028	4.4	4.2600	6.6	0.3056	3.6	1681	90	1715	47	1681	90	-0.9
HC-3	115	6360	0.1034	2.6	4.3070	2.3	0.3029	2.3	1681	26	1706	35	1681	26	-1.5
HC-3	75	55800	0.1035	2.5	4.2760	2.3	0.3025	2.3	1681	26	1704	35	1681	26	-1.4
HC-3	86	36000	0.1035	2.2	4.2300	2.6	0.2986	2.7	1681.9	33	1686	41	1681.9	33	0.2
HC-3	98	581	0.1039	3.2	4.1800	3.1	0.2941	2.6	1683	34	1661	37	1683	34	1.3
HC-3	76	1458	0.1137	3.7	4.1200	3.6	0.2935	2.9	1685	50	1686	38	1685	50	8.3
HC-3	36	8814	0.1029	2.4	4.1530	2.2	0.2936	2.4	1685	24	1659	34	1685	24	1.5
HC-3	67	23967	0.1039	2.5	4.4170	2.7	0.3080	2.6	1685	36	1729	38	1685	36	-1.6
HC-3	34	7330	0.1033	2.4	4.4290	2.3	0.3119	2.4	1686	29	1750	36	1686	29	-3.8
HC-3	106	11371	0.1034	2.4	4.2750	2.2	0.2987	2.3	1687	29	1684.8	34	1687	29	0.1
HC-3	105	350000	0.1026	2.5	4.5480	2.6	0.3170	2.5	1687	45	1775	37	1687	45	-6.6
HC-3	63	16450	0.1032	2.8	4.2150	2.4	0.2989	2.4	1688	22	1686	35	1688	22	0.1
HC-3	57	7997	0.1038	2.3	4.1880	2.2	0.2943	2.3	1689	28	1663	34	1689	28	1.6
HC-3	100	9847	0.1040	2.3	4.2630	2.6	0.2992	2.7	1689	30	1690	38	1689	30	0.4
HC-3	73	14750	0.1037	2.4	4.2680	2.3	0.2995	2.7	1689	30	1688	39	1689	30	0.1
HC-3	96	5619	0.1033	2.4	4.2290	2.2	0.2973	2.4	1690	23	1678	35	1690	23	0.7
HC-3	87	30000	0.1035	2.5	4.4310	2.5	0.3097	2.6	1690	29	1738	40	1690	29	-2.8
HC-3	29	12288	0.1043	2.3	4.2640	2.1	0.2976	2.3	1690.7	21	1679.1	34	1690.7	21	0.7
HC-3	94	56200	0.1034	2.6	4.3830	2.2	0.3062	2.4	1692	31	1722	36	1692	31	-1.8
HC-3	52	21937	0.1043	2.4	4.2930	2.3	0.2981	2.4	1693	34	1682	35	1693	34	0.8
HC-3	8	8267	0.1040	2.3	4.3740	2.2	0.3056	2.3	1695.5	25	1718.7	35	1695.5	25	-1.4
HC-3	6	20900	0.1036	2.6	4.4880	2.5	0.3166	2.5	1698	27	1773	39	1698	27	-4.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-3	49	59700	0.1043	2.3	4.3360	2.0	0.3017	2.3	1704.1	25	1699.9	34	1704.1	25	0.2
HC-3	66	11567	0.1046	2.5	4.3280	2.3	0.3004	2.3	1709	26	1693	35	1709	26	0.9
HC-3	56	7120	0.1051	2.9	4.2670	2.8	0.2941	2.7	1710	28	1662	39	1710	28	2.8
HC-3	107	2183	0.1045	3.1	4.3160	2.8	0.2989	2.6	1711	49	1686	37	1711	49	0.7
HC-3	13	6450	0.1047	2.5	4.2300	2.2	0.2953	2.4	1711	27	1669	35	1711	27	2.5
HC-3	32	6867	0.1049	2.8	4.6180	2.8	0.3150	2.4	1712	38	1764	37	1712	38	-2.6
HC-3	79	38850	0.1048	2.4	4.3790	2.3	0.3031	2.4	1714	32	1706.7	35	1714	32	0.5
HC-3	33	40900	0.1050	2.3	4.1900	2.2	0.2899	2.4	1714	28	1641	34	1714	28	4.3
HC-3	90	5950	0.1050	2.9	4.4080	2.5	0.3062	2.4	1715	23	1722	37	1715	23	-0.4
HC-3	82	6029	0.1053	2.4	4.4710	2.5	0.3094	2.4	1715	26	1738	37	1715	26	-1.5
HC-3	74	15580	0.1052	2.4	4.4350	2.5	0.3067	2.4	1716	27	1725	36	1716	27	0.0
HC-3	53	28300	0.1053	2.3	4.3940	2.3	0.3051	2.5	1716.5	24	1716	38	1716.5	24	0.0
HC-3	30	9880	0.1065	2.5	4.4370	2.7	0.3051	2.6	1717	40	1717	37	1717	40	0.7
HC-3	99	22467	0.1051	2.5	4.1840	2.9	0.2866	3.0	1718	29	1623	44	1718	29	5.5
HC-3	21	30240	0.1053	2.6	4.3110	2.8	0.2981	2.6	1723	43	1682	37	1723	43	1.9
HC-3	117	4379	0.1058	2.4	4.2990	2.2	0.2963	2.3	1724	27	1673	34	1724	27	3.0
HC-3	3	2978	0.1042	3.4	4.1890	2.9	0.2909	2.6	1726	35	1646	38	1726	35	4.6
HC-3	7	3071	0.1052	3.0	4.4880	2.7	0.3106	2.5	1726	29	1743	38	1726	29	-1.0
HC-3	20	350000	0.1050	2.3	4.4320	3.2	0.3044	2.8	1730	34	1712	41	1730	34	0.3
HC-3	42	5468	0.1067	2.4	4.1680	2.4	0.2888	2.5	1732	32	1638	36	1732	32	5.7
HC-3	22	3501	0.1067	2.7	4.3510	2.5	0.3015	2.6	1734	38	1696	36	1734	38	2.3
HC-3	17	8167	0.1051	3.1	4.2260	2.8	0.2913	2.4	1735	27	1648	35	1735	27	5.0
HC-3	31	6130	0.1074	2.4	4.4910	2.9	0.3046	2.4	1741	36	1718	36	1741	36	1.7
HC-3	68	1731	0.1090	3.1	4.2900	3.0	0.2962	2.8	1743	46	1679	36	1743	46	6.3
HC-3	44	13686	0.1069	2.4	4.5170	2.2	0.3069	2.4	1744	35	1724	35	1744	35	1.3
HC-3	18	10357	0.1071	2.3	4.5530	2.2	0.3079	2.3	1748.7	23	1730	36	1748.7	23	1.1
HC-3	89	8273	0.1072	2.3	4.8100	3.1	0.3252	2.9	1752	25	1813	45	1752	25	-3.4
HC-3	55	6500	0.1072	2.5	4.4440	2.5	0.2988	2.3	1756	36	1684	35	1756	36	3.7
HC-3	77	22600	0.1081	2.6	4.6410	2.4	0.3158	2.3	1762	28	1769	36	1762	28	-0.4
HC-3	60	36300	0.1078	2.3	4.2360	2.4	0.2865	2.5	1762.9	22	1623	36	1762.9	22	7.9
HC-3	54	5458	0.1077	2.6	4.5800	2.4	0.3074	2.3	1774	29	1728	36	1774	29	2.6
HC-3	1	9713	0.1105	2.8	4.4400	2.5	0.2931	2.4	1797	31	1656	35	1797	31	7.8
HC-3	41	38150	0.1106	2.4	4.9120	2.2	0.3221	2.3	1807	26	1800	37	1807	26	0.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-3	85	11277	0.1111	2.3	5.0300	3.0	0.3296	2.8	1815	31	1836	44	1815	31	-1.2
HC-3	83	12067	0.1110	2.3	4.7530	2.3	0.3118	2.4	1818.8	22	1751	38	1818.8	22	3.7
HC-3	10	204	0.1640	3.0	7.2100	10.4	0.3910	5.6	2070	140	2207	90	2070	140	11.5
HC-3	101	4990	0.1268	2.9	6.6500	2.7	0.3824	2.4	2075	30	2087	43	2075	30	-0.6
HC-4	24	912	0.0495	6.1	0.1033	3.1	0.0159	3.3	19	18	102.6	3.2	102.6	3.2	75.6
HC-4	8	637	0.0618	6.0	0.1015	2.3	0.0160	2.9	43	20	104.7	2.9	104.7	2.9	83.9
HC-4	94	1268	0.0506	5.3	0.1109	2.1	0.0171	2.9	37	22	110	2.8	110	2.8	70.2
HC-4	57	297	0.0521	9.6	0.1680	9.5	0.0235	3.7	533	92	149.9	5.4	149.9	5.4	71.9
HC-4	56	398	0.0511	4.9	0.1650	5.3	0.0236	2.7	330	54	150.5	4	150.5	4	54.4
HC-4	84	765	0.0537	5.4	0.2517	2.5	0.0375	2.7	140	34	238.9	6.1	238.9	6.1	39.7
HC-4	76	1058	0.0557	4.3	0.4630	4.8	0.0608	2.5	456	50	380.5	9.4	380.5	9.4	16.6
HC-4	116	933	0.0545	4.6	0.5150	3.3	0.0705	2.8	310	54	439.8	11	439.8	11	-3.7
HC-4	31	7375	0.0570	3.7	0.5290	4.7	0.0704	3.0	356	66	439.9	12	439.9	12	7.8
HC-4	99	10940	0.0528	4.4	0.5150	4.7	0.0708	2.5	388	57	441.1	11	441.1	11	-13.7
HC-4	125	12446	0.0974	2.8	1.0800	3.7	0.1210	2.4	765.6	18	765.6	17	765.6	18	51.3
HC-4	4	1028	0.0989	3.4	1.0700	10.3	0.1214	8.2	768	110	768	63	768	110	52.5
HC-4	90	8360	0.0707	4.2	1.5210	4.8	0.1564	2.6	975	60	937	22	975	60	3.9
HC-4	131	3730	0.0746	3.2	1.7070	4.0	0.1696	2.7	1015	54	1014	25	1015	54	4.0
HC-4	38	3248	0.0751	3.2	1.8350	3.8	0.1762	2.3	1078	27	1046.1	22	1078	27	3.0
HC-4	33	3933	0.0757	3.4	1.8990	4.0	0.1808	2.4	1080	38	1071	24	1080	38	0.8
HC-4	16	17010	0.0752	3.5	1.9590	4.1	0.1903	2.6	1090	44	1122	27	1090	44	-2.9
HC-4	129	803	0.0762	4.7	2.0560	5.4	0.1950	3.1	1158	64	1145	28	1158	64	-1.1
HC-4	113	8385	0.0858	2.9	2.6210	3.7	0.2242	2.5	1331	30	1304	29	1331	30	2.0
HC-4	61	14267	0.0872	2.9	2.9370	3.4	0.2432	2.3	1374	36	1403.3	29	1374	36	-2.1
HC-4	130	3308	0.0880	3.0	2.9810	3.7	0.2448	2.3	1383	37	1411	30	1383	37	-2.0
HC-4	66	882	0.1114	3.3	3.1100	10.6	0.2370	5.9	1430	110	1383	68	1430	110	23.8
HC-4	71	7600	0.0923	2.9	3.3780	3.8	0.2651	2.3	1462	42	1515	31	1462	42	-3.2
HC-4	89	3591	0.0926	3.0	3.3910	3.5	0.2665	2.3	1478	33	1523	32	1478	33	-3.0
HC-4	101	5719	0.1016	2.8	3.4300	8.2	0.2600	5.4	1532	200	1489	69	1532	200	10.0
HC-4	114	2024	0.0998	2.9	3.4100	7.6	0.2570	4.7	1537	98	1480	59	1537	98	8.9
HC-4	103	2675	0.0980	3.3	3.7780	5.3	0.2840	4.2	1591	38	1614	64	1591	38	-1.4
HC-4	50	9118	0.1020	3.0	3.6600	5.7	0.2707	3.2	1598	64	1556	41	1598	64	6.5
HC-4	13	17160	0.0993	2.8	3.7210	3.8	0.2728	2.5	1607	30	1554	35	1607	30	3.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-4	80	822	0.1009	4.2	4.0400	5.7	0.2956	3.0	1613	69	1671	37	1613	69	-0.3
HC-4	41	17180	0.1000	3.1	3.9750	3.8	0.2881	2.4	1629	30	1632	35	1629	30	-0.2
HC-4	46	9653	0.1004	2.7	3.7200	3.5	0.2699	2.3	1629.1	33	1539.6	32	1629.1	33	5.5
HC-4	20	15580	0.1002	3.8	3.2600	4.9	0.2358	2.8	1631	41	1364	34	1631	41	16.4
HC-4	14	1067	0.1049	3.6	4.0900	7.6	0.3034	3.3	1643	87	1722	43	1643	87	-0.3
HC-4	74	9708	0.1015	2.8	4.2020	3.6	0.3003	2.2	1651.4	34	1691.9	34	1651.4	34	-2.5
HC-4	53	14444	0.1027	2.8	4.2300	4.3	0.2995	2.6	1653	50	1689	39	1653	50	-1.3
HC-4	100	2856	0.1015	3.0	4.2920	3.7	0.3063	2.4	1654	30	1722	36	1654	30	-4.1
HC-4	17	350000	0.1020	2.8	4.2420	3.5	0.3002	2.4	1659	37	1692	34	1659	37	-2.4
HC-4	121	63000	0.1016	3.0	4.1460	3.6	0.2943	2.4	1660	33	1663	35	1660	33	-0.2
HC-4	122	2020	0.1020	2.9	4.2150	3.8	0.2983	2.4	1664	31	1682	36	1664	31	-1.1
HC-4	47	350000	0.1013	3.0	4.1860	4.1	0.2979	2.5	1664	47	1681	35	1664	47	-1.6
HC-4	5	13250	0.1022	2.8	4.1600	4.3	0.2948	2.4	1666	35	1665	34	1666	35	-0.2
HC-4	88	3975	0.1056	3.7	3.9900	7.8	0.2891	4.8	1668	92	1653	69	1668	92	3.8
HC-4	98	4238	0.1034	3.1	3.8500	4.7	0.2782	2.6	1668	44	1583	36	1668	44	5.2
HC-4	65	9320	0.1028	2.9	4.3130	3.7	0.3031	2.3	1671	33	1707	35	1671	33	-2.2
HC-4	134	6909	0.1031	2.8	4.2420	3.5	0.3005	2.3	1672	33	1693.7	34	1672	33	-1.3
HC-4	77	10170	0.1028	2.7	4.2700	3.5	0.3000	2.3	1672	34	1691.2	34	1672	34	-1.1
HC-4	70	34500	0.1031	4.2	4.2190	3.1	0.2994	2.9	1676	32	1691	37	1676	32	-0.4
HC-4	42	17057	0.1031	2.8	4.4400	3.6	0.3130	2.4	1677.9	30	1757	37	1677.9	30	-4.7
HC-4	49	14800	0.1031	2.8	4.5300	3.5	0.3188	2.4	1678	34	1784	36	1678	34	-6.3
HC-4	39	129700	0.1026	2.7	4.1190	3.4	0.2915	2.3	1678.1	28	1648.8	33	1678.1	28	1.7
HC-4	37	1705	0.1032	3.0	4.2570	3.8	0.3005	2.4	1680	29	1694	36	1680	29	-0.8
HC-4	112	350000	0.1033	2.9	4.4910	4.0	0.3157	2.7	1680	49	1769	41	1680	49	-5.0
HC-4	78	14750	0.1042	3.3	4.3540	4.8	0.3072	2.4	1681	60	1731	37	1681	60	-1.6
HC-4	75	7580	0.1034	4.9	4.3140	5.8	0.3013	2.4	1683	62	1697	36	1683	62	-0.8
HC-4	6	350000	0.1031	2.7	4.3250	3.5	0.3036	2.3	1683.5	32	1708.9	34	1683.5	32	-1.4
HC-4	119	7614	0.1036	2.7	4.2870	4.2	0.3033	2.5	1684	41	1708	37	1684	41	-1.3
HC-4	92	37550	0.1033	2.8	4.3210	3.5	0.3042	2.3	1684	27	1712	35	1684	27	-1.7
HC-4	51	5810	0.1026	2.9	4.3000	5.1	0.3023	3.6	1690	46	1703	52	1690	46	-0.8
HC-4	104	13060	0.1024	2.8	4.5540	5.1	0.3176	2.6	1691	42	1776	37	1691	42	-6.5
HC-4	105	9543	0.1042	2.9	4.3460	3.7	0.3034	2.3	1692	32	1708	35	1692	32	-0.9
HC-4	10	53300	0.1039	2.9	4.2720	3.7	0.2993	2.4	1692	28	1688	35	1692	28	0.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
HC-4	87	4838	0.1056	2.8	4.0520	4.9	0.2850	2.7	1694	47	1619	38	1694	47	5.9
HC-4	93	350000	0.1019	3.4	4.0600	5.4	0.2856	2.9	1696	71	1627	36	1696	71	2.4
HC-4	58	11380	0.1043	2.7	4.4040	3.6	0.3058	2.3	1702.8	30	1719.6	34	1702.8	30	-1.0
HC-4	68	17740	0.1043	2.8	4.3350	3.5	0.3007	2.3	1704	31	1694	34	1704	31	0.6
HC-4	3	6982	0.1048	2.8	4.3980	3.6	0.3030	2.4	1709	39	1707	35	1709	39	-0.1
HC-4	59	949	0.1035	3.4	4.3300	6.0	0.2988	2.9	1711	73	1697	36	1711	73	-1.0
HC-4	81	15520	0.1047	2.9	4.2610	3.3	0.2964	2.4	1716	41	1674	34	1716	41	2.3
HC-4	110	20500	0.1049	3.4	4.3710	4.3	0.2991	2.3	1718.9	55	1686.9	35	1718.9	55	1.9
HC-4	115	35550	0.1057	2.7	4.5190	3.8	0.3100	2.4	1720.8	32	1741	36	1720.8	32	-1.3
HC-4	83	13250	0.1060	2.8	4.4750	3.6	0.3083	2.4	1724	31	1736	36	1724	31	-0.7
HC-4	21	13109	0.1063	2.7	4.3740	3.7	0.2984	2.2	1735	33	1683.3	34	1735	33	2.8
HC-4	85	12986	0.1065	2.7	4.7900	4.0	0.3252	2.4	1741	36	1815	36	1741	36	-4.2
HC-4	69	14625	0.1072	2.8	4.8990	3.5	0.3302	2.3	1749	33	1839	37	1749	33	-5.1
HC-4	117	14143	0.1076	2.8	4.6000	4.1	0.3118	2.7	1753	36	1748	41	1753	36	0.4
HC-4	19	2434	0.1103	3.6	4.6800	5.3	0.3148	2.7	1757	67	1770	38	1757	67	2.7
HC-4	5	4350	0.1113	3.1	5.1470	4.3	0.3309	2.5	1820	51	1847	38	1820	51	-1.0
HC-4	15	9433	0.1123	2.8	5.4520	3.5	0.3520	2.3	1835	32	1944	39	1835	32	-5.9
HC-4	26	55550	0.1125	2.8	5.2300	5.0	0.3351	3.0	1849	45	1860	48	1849	45	-1.1
HC-4	126	17678	0.1173	2.7	5.8600	3.4	0.3590	2.8	1907	41	1977	39	1907	41	-3.4
HC-4	67	10400	0.1181	3.0	5.5800	4.1	0.3439	2.5	1931	46	1905	40	1931	46	1.2
HC-4	62	13913	0.1282	3.0	6.5930	3.6	0.3728	2.4	2082	29	2042	42	2082	29	1.9
HC-4	102	9213	0.1328	2.8	7.1940	3.5	0.3928	2.3	2133.3	27	2135	42	2133.3	27	-0.1
HC-4	106	5810	0.1868	2.7	13.2200	4.6	0.5169	2.5	2700	42	2689	51	2700	42	0.8
SEM-002	28	550	0.0591	606.9	0.1180	11.0	0.0152	3.9	730	110	97.3	3.7	97.3	3.7	86.7
SEM-002	68	191	0.0491	714.2	0.1008	4.5	0.0157	4.5	22	22	99.1	4.3	99.1	4.3	84.6
SEM-002	110	397	0.0500	869.3	0.1000	2.8	0.0156	3.0	22	15	99.9	2.7	99.9	2.7	80.9
SEM-002	42	586	0.0490	893.1	0.1399	3.4	0.0217	3.3	17	15	138.8	4.2	138.8	4.2	75.4
SEM-002	106	2647	0.0503	470.9	0.1532	5.9	0.0219	2.4	328	64	139.8	3.3	139.8	3.3	57.4
SEM-002	85	350000	0.0480	596.9	0.1500	2.3	0.0232	2.2	45	20	147.7	3	147.7	3	66.7
SEM-002	83	11780	0.0501	580.0	0.2590	3.7	0.0377	1.7	320	59	238.7	3.9	238.7	3.9	25.4
SEM-002	71	433	0.0537	195.3	0.3290	4.6	0.0443	2.9	370	50	279.4	8.1	279.4	8.1	24.5
SEM-002	95	1202	0.0565	435.1	0.3960	3.5	0.0506	1.5	483	56	318.4	4.6	318.4	4.6	34.1
SEM-002	96	2108	0.0547	125.2	0.4240	3.8	0.0579	3.6	319	39	363	12	363	12	14.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-002	67	1456	0.0582	360.4	0.5000	3.0	0.0637	1.9	530	47	397.9	7.5	397.9	7.5	24.9
SEM-002	119	1208	0.0568	525.0	0.5400	3.0	0.0681	1.5	511	46	424.7	6.3	424.7	6.3	16.9
SEM-002	59	3102	0.0558	469.5	0.5510	2.4	0.0731	1.8	394	55	455.4	7	455.4	7	5.5
SEM-002	118	350000	0.0591	538.3	0.6400	2.2	0.0828	1.6	431	63	516.1	7.3	516.1	7.3	9.5
SEM-002	45	2533	0.0606	306.6	0.8030	3.1	0.0990	2.1	527	62	610.7	12	527	62	3.4
SEM-002	40	19038	0.1008	-408.4	1.3340	2.7	0.1408	2.1	882	52	882	17	882	52	46.3
SEM-002	62	1429	0.0811	388.5	1.9040	5.3	0.1836	3.6	1035	68	1089	35	1035	68	11.3
SEM-002	114	9075	0.0737	241.8	1.6780	2.0	0.1662	1.7	1042	41	993	15	1042	41	4.8
SEM-002	63	1653	0.0760	417.2	1.9140	2.1	0.1829	1.4	1097	36	1082.8	14	1097	36	1.3
SEM-002	82	7629	0.1061	315.1	1.9930	4.7	0.1836	1.9	1147	89	1122	16	1147	89	35.2
SEM-002	89	10040	0.0787	100.2	2.1000	2.0	0.1938	1.7	1172	31	1142	18	1172	31	2.6
SEM-002	88	6154	0.0795	369.6	2.2110	2.1	0.2025	1.3	1182	33	1188.5	14	1182	33	-0.5
SEM-002	84	873	0.1039	116.8	2.0700	6.8	0.1893	4.0	1209	98	1147	39	1209	98	32.1
SEM-002	13	8058	0.0819	521.0	2.4520	1.8	0.2159	1.4	1247	38	1260.2	16	1247	38	-1.1
SEM-002	92	1646	0.0830	149.8	2.4960	2.0	0.2170	1.4	1272	39	1267	16	1272	39	0.6
SEM-002	78	1770	0.0898	403.8	2.7600	4.0	0.2321	1.9	1349	73	1350	19	1349	73	4.0
SEM-002	107	350000	0.0890	44.1	2.7100	3.3	0.2246	2.2	1377	48	1309	25	1377	48	6.9
SEM-002	39	1655	0.0894	397.8	3.0200	3.6	0.2422	2.0	1428	43	1397	25	1428	43	2.2
SEM-002	108	40660	0.0942	184.7	3.3220	1.5	0.2557	1.2	1506.8	25	1467.5	16	1506.8	25	2.6
SEM-002	94	2997	0.0929	356.8	3.4860	2.8	0.2693	1.7	1515	28	1537	23	1515	28	-1.5
SEM-002	2	8500	0.1007	180.0	3.7820	3.2	0.2821	1.6	1568	81	1604	23	1568	81	2.7
SEM-002	115	2956	0.1042	60.9	3.5800	5.0	0.2664	3.0	1571	91	1527	39	1571	91	10.8
SEM-002	51	713	0.1024	325.7	4.0700	4.2	0.2940	2.2	1627	68	1671	28	1627	68	0.2
SEM-002	56	1845	0.1002	216.0	3.9050	1.9	0.2830	1.6	1631	33	1608	23	1631	33	1.4
SEM-002	52	10443	0.1016	287.7	4.2120	1.6	0.3002	1.3	1647	41	1693.5	19	1647	41	-2.0
SEM-002	21	4940	0.1022	265.0	3.9400	3.6	0.2837	2.5	1652	35	1608	35	1652	35	2.7
SEM-002	27	10613	0.1020	217.4	4.0740	1.7	0.2900	1.5	1654	30	1641	22	1654	30	0.8
SEM-002	98	350000	0.1075	371.0	4.0100	6.0	0.2881	2.7	1655	97	1645	33	1655	97	5.6
SEM-002	61	9738	0.1018	280.2	4.0130	1.8	0.2885	1.4	1656	38	1636.9	19	1656	38	1.3
SEM-002	37	350000	0.1043	488.5	3.9000	5.4	0.2873	2.4	1662	110	1637	29	1662	110	4.4
SEM-002	16	2685	0.1018	23.4	4.1790	2.0	0.2970	1.3	1669	32	1676	20	1669	32	-0.4
SEM-002	7	13975	0.1026	228.8	4.1010	1.5	0.2908	1.3	1669	30	1645.3	18	1669	30	1.4
SEM-002	43	31237	0.1027	90.1	4.0850	2.0	0.2902	1.7	1673	37	1642	24	1673	37	1.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-002	50	6010	0.1034	231.0	4.1560	2.2	0.2907	1.6	1675	33	1645	23	1675	33	1.8
SEM-002	72	7350	0.1027	90.8	4.2240	1.4	0.2980	1.2	1675	31	1681.2	18	1675	31	-0.4
SEM-002	8	11433	0.1024	303.1	4.2250	1.9	0.2994	1.5	1680	30	1688	22	1680	30	-0.5
SEM-002	69	1691	0.1035	305.0	4.1800	2.6	0.2959	1.7	1681	35	1670	24	1681	35	0.7
SEM-002	15	3948	0.1035	352.6	4.1180	1.9	0.2918	1.3	1681	34	1651	20	1681	34	1.8
SEM-002	111	6548	0.1037	274.0	4.0840	2.1	0.2846	1.4	1681	29	1614	21	1681	29	4.0
SEM-002	105	28900	0.1029	215.2	4.2660	2.1	0.2986	1.5	1681	33	1684	22	1681	33	-0.2
SEM-002	24	2089	0.1043	443.6	4.2820	2.3	0.3006	1.5	1685	35	1694	23	1685	35	-0.5
SEM-002	102	38367	0.1035	323.5	4.2370	1.5	0.2966	1.2	1688	29	1674.1	18	1688	29	0.8
SEM-002	1	5434	0.1022	305.2	4.1570	2.3	0.2899	1.4	1689	39	1642	21	1689	39	1.6
SEM-002	31	3442	0.1038	396.5	4.3730	1.7	0.3052	1.5	1690	42	1715	22	1690	42	-1.7
SEM-002	3	5715	0.1036	366.9	4.1920	1.7	0.2949	1.3	1690	36	1666	19	1690	36	1.3
SEM-002	79	70200	0.1033	307.2	4.1640	1.6	0.2924	1.3	1691	41	1653.4	18	1691	41	2.5
SEM-002	104	1287	0.1040	104.9	4.0790	2.2	0.2859	1.6	1692	36	1620	23	1692	36	4.3
SEM-002	81	32250	0.1041	250.4	4.1810	1.5	0.2926	1.3	1692.8	26	1654.6	18	1692.8	26	2.3
SEM-002	120	2715	0.1039	69.1	4.1650	2.3	0.2903	2.0	1697	32	1642	30	1697	32	3.2
SEM-002	22	1784	0.1048	306.7	4.1800	3.8	0.2950	2.1	1702	59	1662	26	1702	59	3.1
SEM-002	46	15150	0.1045	-96.0	4.4230	1.7	0.3067	1.3	1706	37	1724	20	1706	37	-1.1
SEM-002	75	4055	0.1056	-93.7	4.1900	3.1	0.2904	2.4	1707	39	1644	35	1707	39	4.6
SEM-002	34	8767	0.1049	271.3	4.2180	1.8	0.2947	1.4	1709	29	1665	21	1709	29	2.6
SEM-002	86	5730	0.1048	21.8	4.1030	1.7	0.2829	1.3	1711	44	1604	19	1711	44	6.1
SEM-002	4	12545	0.1038	315.7	4.2500	2.6	0.2968	1.5	1714	52	1671	22	1714	52	1.1
SEM-002	29	12575	0.1055	442.1	4.4090	1.7	0.3026	1.4	1720	44	1700	21	1720	44	1.3
SEM-002	109	4553	0.1053	255.4	4.2320	2.4	0.2957	1.5	1721	48	1668	20	1721	48	2.7
SEM-002	58	3583	0.1054	291.4	4.4160	1.6	0.3041	1.3	1729	32	1711	20	1729	32	1.0
SEM-002	35	1446	0.1066	423.2	4.3500	3.0	0.2996	2.0	1730	55	1688	27	1730	55	3.3
SEM-002	10	33083	0.1071	-1.9	3.8640	1.9	0.2614	1.9	1752.5	44	1497	25	1752.5	44	14.5
SEM-002	116	296	0.1084	128.4	4.8290	2.0	0.3215	1.5	1764	46	1797	23	1764	46	-0.8
SEM-002	90	2189	0.1084	300.5	4.6750	1.9	0.3123	1.4	1766	30	1752	21	1766	30	0.8
SEM-002	97	13817	0.1080	112.9	4.4250	1.9	0.2988	1.6	1769.8	25	1685	24	1769.8	25	4.8
SEM-002	101	5313	0.1096	231.0	4.8550	1.7	0.3206	1.3	1791	33	1793	21	1791	33	-0.1
SEM-002	55	5510	0.1095	258.5	4.6700	2.6	0.3108	1.7	1795	36	1744	25	1795	36	2.8
SEM-002	18	58200	0.1127	264.0	4.8660	1.3	0.3133	1.2	1840	30	1757.1	18	1840	30	4.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-002	41	4957	0.1363	0.8	7.3600	2.2	0.3904	1.7	2188	31	2126	30	2188	31	2.8
SEM-004	101	1390	0.0495	3.4	0.0879	3.1	0.0129	2.2	247	32	82.61	1.8	82.61	1.8	66.6
SEM-004	100	4580	0.0488	3.9	0.0966	3.7	0.0143	2.2	310	42	91.4	2	91.4	2	70.5
SEM-004	108	5513	0.0484	6.4	0.0951	6.1	0.0143	2.7	319	57	91.5	2.5	91.5	2.5	71.3
SEM-004	3	219	0.0504	8.3	0.0936	2.6	0.0145	3.3	7.9	5.4	92.9	2.7	92.9	2.7	80.0
SEM-004	55	228	0.0461	6.9	0.0931	6.6	0.0147	2.7	377	56	94	2.5	94	2.5	75.1
SEM-004	82	460	0.0475	6.1	0.0959	2.4	0.0147	2.9	28	17	94.3	2.6	94.3	2.6	65.2
SEM-004	54	194	0.0500	7.8	0.1008	7.4	0.0148	2.9	449	66	94.6	2.7	94.6	2.7	78.9
SEM-004	44	1139	0.0480	5.2	0.1022	1.9	0.0157	2.5	45	23	100.1	2.5	100.1	2.5	68.3
SEM-004	99	1664	0.0710	15.5	0.1460	16.4	0.0157	3.9	1200	250	100.5	3.9	100.5	3.9	91.6
SEM-004	64	868	0.0471	6.2	0.1034	1.9	0.0160	2.7	24	18	102.1	2.7	102.1	2.7	69.4
SEM-004	42	993	0.0491	3.9	0.1026	1.7	0.0160	2.5	39	17	102.8	2.4	102.8	2.4	63.2
SEM-004	70	1709	0.0497	3.6	0.1111	3.5	0.0162	2.2	319	52	103.6	2.2	103.6	2.2	67.5
SEM-004	22	335	0.0485	6.0	0.1121	5.9	0.0168	2.4	397	63	107.6	2.6	107.6	2.6	72.9
SEM-004	4	1111	0.0564	3.2	0.4660	2.8	0.0661	2.6	264	55	415.8	9.3	415.8	9.3	8.6
SEM-004	33	3039	0.0981	0.9	0.9127	0.9	0.1064	2.2	680.9	3.9	680.9	13	680.9	3.9	57.1
SEM-004	9	2302	0.0741	4.0	1.7380	3.5	0.1741	2.8	1035	42	1034	27	1035	42	0.1
SEM-004	48	5643	0.0794	1.9	2.1200	1.9	0.1954	2.3	1192	24	1150	24	1192	24	3.5
SEM-004	107	12290	0.0885	2.4	2.8560	2.6	0.2391	2.4	1336	42	1381	27	1336	42	0.2
SEM-004	81	1312	0.0871	3.1	2.9300	3.8	0.2449	2.8	1379	44	1414	31	1379	44	-1.9
SEM-004	58	38725	0.0892	0.8	2.9190	0.9	0.2388	1.9	1400.8	7.9	1379.5	24	1400.8	7.9	1.6
SEM-004	118	15600	0.0894	0.7	2.9890	0.7	0.2433	1.9	1408.5	9.4	1403.7	24	1408.5	9.4	0.5
SEM-004	98	3711	0.0894	1.6	2.9710	1.5	0.2401	2.0	1416	19	1390.2	25	1416	19	1.5
SEM-004	25	17795	0.0899	1.8	3.0370	2.1	0.2466	2.2	1417	25	1419	27	1417	25	0.2
SEM-004	77	726	0.0904	4.1	3.0800	3.9	0.2419	2.6	1458	44	1396	33	1458	44	4.3
SEM-004	67	6240	0.0909	2.1	2.9850	2.2	0.2376	2.2	1459	21	1376	27	1459	21	5.7
SEM-004	37	10535	0.0948	1.8	3.3370	1.6	0.2583	2.1	1518	16	1481	28	1518	16	2.4
SEM-004	87	1710	0.1001	2.5	4.0600	3.0	0.2913	2.3	1634	31	1648	34	1634	31	-0.9
SEM-004	7	9150	0.1014	1.5	4.2270	1.5	0.3006	2.0	1637	23	1694	30	1637	23	-2.7
SEM-004	63	4993	0.1017	2.4	4.1030	2.3	0.2907	2.1	1640	24	1645	31	1640	24	-0.3
SEM-004	75	5030	0.1012	3.0	4.0200	3.0	0.2861	2.5	1653	30	1621	35	1653	30	1.9
SEM-004	38	4614	0.1020	0.9	4.1140	0.9	0.2927	1.9	1663	10	1655	28	1663	10	0.5
SEM-004	106	56700	0.1022	1.2	4.0910	1.1	0.2912	2.0	1668	14	1647.1	29	1668	14	1.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-004	89	37000	0.1031	0.8	4.1600	2.6	0.2952	3.0	1668.5	9.1	1666	44	1668.5	9.1	0.7
SEM-004	27	468	0.1022	2.7	4.4200	4.1	0.3058	2.7	1671	62	1728	36	1671	62	-2.5
SEM-004	56	34110	0.1029	0.9	4.2140	0.9	0.2978	2.0	1671	11	1680.7	29	1671	11	-0.4
SEM-004	116	1896	0.1040	1.7	4.3960	1.9	0.3048	2.0	1680	27	1717	31	1680	27	-1.4
SEM-004	103	2983	0.1021	1.8	4.1300	1.7	0.2929	2.1	1680	18	1657	31	1680	18	1.4
SEM-004	41	12717	0.1031	1.1	4.3640	1.2	0.3064	2.0	1680	16	1724.1	29	1680	16	-2.7
SEM-004	83	20767	0.1032	1.1	4.1190	1.2	0.2912	2.1	1681	15	1647	30	1681	15	2.0
SEM-004	91	7460	0.1073	4.6	3.9800	6.0	0.2886	3.5	1682	84	1656	39	1682	84	6.1
SEM-004	95	8740	0.1027	1.3	4.2270	1.3	0.2959	2.1	1683	14	1670	31	1683	14	0.8
SEM-004	85	2777	0.1034	1.1	4.3070	1.0	0.3027	2.0	1684	12	1705	30	1684	12	-1.2
SEM-004	112	15570	0.1033	1.5	4.0900	1.9	0.2889	2.4	1684	21	1639	31	1684	21	2.4
SEM-004	71	2366	0.1028	1.6	4.2810	1.7	0.2993	2.2	1685	20	1691	30	1685	20	-1.0
SEM-004	96	10567	0.1036	1.5	4.2470	1.5	0.2965	2.1	1686	17	1673	31	1686	17	0.8
SEM-004	23	2195	0.1043	2.0	4.0500	3.5	0.2866	2.6	1687	43	1623	32	1687	43	4.4
SEM-004	104	29127	0.1034	1.0	4.1570	0.9	0.2887	2.0	1687.4	9.6	1635	29	1687.4	9.6	3.1
SEM-004	78	3244	0.1033	1.1	4.2800	1.1	0.3003	2.0	1689	12	1693	29	1689	12	-0.2
SEM-004	47	54700	0.1043	1.2	4.4090	1.1	0.3064	2.0	1689	13	1723	30	1689	13	-2.0
SEM-004	69	2630	0.1042	1.6	4.3050	1.4	0.3016	2.1	1692	17	1699	31	1692	17	-0.4
SEM-004	39	4479	0.1036	1.4	4.4150	1.3	0.3114	2.0	1692	15	1747	31	1692	15	-3.3
SEM-004	34	19508	0.1036	0.7	4.2680	0.8	0.2952	1.9	1693.8	8	1667.4	28	1693.8	8	1.6
SEM-004	94	2466	0.1039	1.1	4.4070	1.1	0.3057	2.0	1694	11	1719	30	1694	11	-1.5
SEM-004	5	575	0.1038	2.0	4.3210	2.0	0.2990	2.2	1695	23	1686	32	1695	23	0.5
SEM-004	84	28015	0.1035	1.3	4.2970	1.3	0.3000	2.1	1695	15	1691	30	1695	15	0.1
SEM-004	111	2520	0.1052	2.8	4.1100	3.9	0.2894	2.8	1696	55	1646	36	1696	55	5.9
SEM-004	2	2674	0.1037	2.3	4.3930	2.2	0.3064	2.3	1696	25	1723	34	1696	25	-1.6
SEM-004	45	2597	0.1043	0.9	4.2970	0.9	0.2993	1.9	1697.2	9.7	1687.8	29	1697.2	9.7	0.6
SEM-004	61	15265	0.1034	1.6	4.2460	2.3	0.2981	2.2	1698	22	1679	32	1698	22	0.7
SEM-004	93	1532	0.1040	1.1	4.2860	1.0	0.2985	2.0	1699.1	9.8	1685	30	1699.1	9.8	0.8
SEM-004	59	4660	0.1055	1.6	4.2660	2.1	0.2963	2.4	1701	30	1678	31	1701	30	1.9
SEM-004	35	39830	0.1039	1.3	4.4440	1.2	0.3089	2.0	1701	15	1735	31	1701	15	-2.0
SEM-004	68	4882	0.1037	1.4	4.3680	1.3	0.3017	2.1	1702	13	1699	31	1702	13	0.2
SEM-004	8	10450	0.1042	1.2	4.5040	1.6	0.3111	2.1	1702	19	1745	31	1702	19	-2.8
SEM-004	49	6370	0.1039	1.8	4.2240	1.9	0.2942	2.3	1703	18	1662	33	1703	18	2.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-004	30	448	0.1042	3.5	4.1700	3.4	0.2952	2.6	1705	38	1666	38	1705	38	2.3
SEM-004	40	1756	0.1059	2.2	4.0900	3.9	0.2855	2.7	1705	61	1628	30	1705	61	5.3
SEM-004	20	744	0.1048	2.9	4.2200	3.1	0.2927	2.4	1706	30	1654	35	1706	30	3.0
SEM-004	17	3564	0.1041	1.4	4.2520	1.4	0.2974	2.1	1706	18	1680	31	1706	18	1.5
SEM-004	110	4210	0.1050	1.3	4.2920	1.4	0.2954	2.0	1706	13	1670	30	1706	13	2.1
SEM-004	12	13860	0.1043	0.7	4.2630	0.7	0.2958	1.9	1708.5	8.4	1670.3	28	1708.5	8.4	2.2
SEM-004	114	7911	0.1045	1.1	4.2330	1.2	0.2945	2.1	1710	16	1664	30	1710	16	2.2
SEM-004	115	350000	0.1028	2.1	4.4600	2.7	0.3086	2.3	1710	43	1722	31	1710	43	-2.4
SEM-004	113	1402	0.1117	2.8	4.3800	3.2	0.3079	2.6	1711	55	1744	37	1711	55	3.5
SEM-004	18	1694	0.1043	2.1	4.3270	2.0	0.3004	2.1	1711	21	1693	31	1711	21	1.1
SEM-004	46	7038	0.1053	1.1	4.4260	1.2	0.3057	2.0	1711	12	1719	30	1711	12	-0.5
SEM-004	105	1138	0.1052	2.4	4.4210	2.2	0.3057	2.2	1714	29	1719	33	1714	29	-0.3
SEM-004	19	7075	0.1049	1.0	4.3650	0.9	0.3032	1.9	1716	10	1707.2	29	1716	10	0.5
SEM-004	74	5736	0.1054	1.1	4.1460	1.0	0.2874	2.0	1717	15	1629.9	28	1717	15	4.6
SEM-004	36	5916	0.1040	1.3	4.2490	1.3	0.2918	2.0	1717	19	1650	29	1717	19	3.5
SEM-004	109	1655	0.1041	1.6	4.4180	1.6	0.3049	2.1	1718	19	1715	32	1718	19	0.2
SEM-004	14	3265	0.1053	1.2	4.3040	1.2	0.2976	2.0	1718	12	1679	29	1718	12	2.3
SEM-004	24	5036	0.1054	0.8	4.2070	1.9	0.2893	2.5	1718.7	9.7	1639	35	1718.7	9.7	4.9
SEM-004	29	350000	0.1059	0.9	4.4090	1.1	0.3040	2.1	1722	12	1713	31	1722	12	0.7
SEM-004	102	1381	0.1059	1.6	4.2520	1.6	0.2924	2.0	1726	18	1655	29	1726	18	4.1
SEM-004	50	4618	0.1080	1.8	4.3300	3.0	0.2963	2.4	1736	33	1666	35	1736	33	5.4
SEM-004	86	3404	0.1070	1.4	4.3910	1.4	0.2971	2.0	1740	14	1678	31	1740	14	3.6
SEM-004	57	2253	0.1067	2.4	4.3600	2.3	0.3007	2.5	1744	36	1693	36	1744	36	2.3
SEM-004	11	350000	0.1040	1.7	4.3790	2.1	0.2974	2.3	1744	35	1679	33	1744	35	1.2
SEM-004	32	1163	0.1072	3.1	4.3800	4.3	0.2983	3.0	1748	59	1683	41	1748	59	3.2
SEM-004	53	20307	0.1070	1.5	4.3320	1.3	0.2987	2.1	1750	19	1685	31	1750	19	3.7
SEM-004	121	4431	0.1073	1.0	4.7040	1.0	0.3173	2.0	1756	11	1776	31	1756	11	-1.1
SEM-004	65	11400	0.1071	0.9	4.3660	1.1	0.2975	2.0	1758	13	1679	29	1758	13	4.5
SEM-004	10	350000	0.1087	1.4	4.8770	1.6	0.3235	2.1	1758	18	1806	33	1758	18	-2.7
SEM-004	52	8225	0.1083	1.1	4.8130	1.2	0.3206	2.0	1776	13	1792	32	1776	13	-0.9
SEM-004	1	5773	0.1088	0.9	4.7410	1.2	0.3156	2.0	1780	11	1769	31	1780	11	0.6
SEM-004	31	11270	0.1119	1.5	4.9840	1.5	0.3247	2.1	1832	17	1812	32	1832	17	1.2
SEM-004	88	4191	0.1284	1.4	6.7050	1.5	0.3818	2.1	2075	19	2086	36	2075	19	-0.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-004	51	5000	0.1844	0.7	12.9100	1.2	0.5040	2.2	2706	10	2634	45	2706	10	2.3
SEM-005	7	168	0.0502	14.7	0.0935	4.2	0.0147	4.1	4.6	3.9	93.1	3.4	93.1	3.4	88.1
SEM-005	15	6105	0.0490	5.5	0.1004	4.6	0.0149	1.5	223	30	95.5	1.4	95.5	1.4	57.2
SEM-005	120	1598	0.0474	6.8	0.1000	6.0	0.0151	1.6	256	48	96.9	1.5	96.9	1.5	62.1
SEM-005	75	136	0.0550	10.7	0.1016	3.4	0.0156	3.1	100	71	100.9	2.7	100.9	2.7	82.9
SEM-005	107	1250	0.0520	9.0	0.1497	3.2	0.0230	3.1	61	34	146	4	146	4	63.7
SEM-005	31	970	0.0519	6.2	0.1682	5.4	0.0239	1.4	316	49	152.5	2.2	152.5	2.2	51.7
SEM-005	113	289	0.0541	6.3	0.2550	5.5	0.0342	1.8	440	54	216.7	3.9	216.7	3.9	50.8
SEM-005	56	1155	0.0925	5.8	0.2051	0.9	0.0323	0.9	1.598	0.018	217.1	9.9	217.1	9.9	85.1
SEM-005	97	3491	0.0604	5.0	0.2285	2.3	0.0353	1.4	86	36	227.5	3.1	227.5	3.1	63.2
SEM-005	70	2148	0.0888	4.6	0.4725	1.3	0.0624	1.2	407.5	4.3	407.5	5.1	407.5	5.1	70.9
SEM-005	62	503	0.1018	5.1	0.4510	5.1	0.0622	2.9	307	67	414	14	414	14	75.2
SEM-005	49	1108	0.0995	4.6	0.5560	2.2	0.0714	1.7	474.3	8.6	468.7	8	468.7	8	71.1
SEM-005	50	12650	0.0958	4.6	0.5820	2.1	0.0741	1.8	491	9.4	484.1	9.5	484.1	9.5	68.8
SEM-005	117	785	0.1091	4.7	0.6090	7.2	0.0783	5.7	498	35	519	30	519	30	70.9
SEM-005	64	1269	0.1070	4.6	0.7530	10.5	0.0864	7.3	576	41	563	55	576	41	67.5
SEM-005	78	1375	0.0988	4.6	0.7265	1.3	0.0889	1.0	576	5.4	576	6.9	576	5.4	63.9
SEM-005	63	7200	0.0965	4.6	0.8680	6.0	0.1018	4.6	650	28	650	28	650	28	58.3
SEM-005	60	3060	0.0941	4.7	0.8670	1.5	0.1023	1.2	653.6	6.9	653.6	7.5	653.6	6.9	56.5
SEM-005	6	23940	0.0998	4.6	0.8720	3.7	0.1025	2.8	658	17	658	43	658	17	59.4
SEM-005	83	461	0.1240	4.6	1.0400	1.3	0.1166	1.0	765.9	7.5	765.9	8.8	765.9	7.5	62.0
SEM-005	87	23575	0.0984	4.6	1.0920	2.4	0.1220	1.8	771	12	771	25	771	12	51.4
SEM-005	98	1424	0.1061	4.6	1.0990	1.2	0.1222	0.9	780.3	6.3	780.3	8.4	780.3	6.3	55.2
SEM-005	33	429	0.1328	4.7	1.1920	1.7	0.1283	1.2	847	10	845	9.6	847	10	60.4
SEM-005	93	6924	0.1001	4.6	1.4730	1.2	0.1515	0.9	940.8	7	940.8	9.6	940.8	7	42.1
SEM-005	54	1901	0.0736	5.2	1.6700	2.2	0.1691	1.1	967	40	1009	12	967	40	-0.1
SEM-005	77	1735	0.0725	5.0	1.6510	4.2	0.1649	1.2	1009	27	983.6	11	1009	27	2.5
SEM-005	118	1636	0.1097	4.6	1.6790	1.5	0.1663	0.9	1029	11	1032.9	10	1029	11	42.4
SEM-005	82	3218	0.0993	4.6	1.6600	6.6	0.1616	4.0	1029	50	992	35	1029	50	38.3
SEM-005	81	1875	0.0741	4.7	1.8290	3.9	0.1802	1.2	1042	20	1067.7	11	1042	20	-2.5
SEM-005	19	1908	0.0842	5.9	1.8510	3.8	0.1814	1.9	1074	68	1090	17	1074	68	16.5
SEM-005	85	52400	0.0758	4.6	1.9360	1.5	0.1844	0.8	1092	25	1091.4	12	1092	25	1.0
SEM-005	55	2018	0.0908	4.7	2.0340	2.3	0.1882	1.3	1180	26	1126	15	1180	26	22.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-005	57	8342	0.1051	4.6	2.1690	2.4	0.1971	1.6	1191	17	1194	18	1191	17	30.5
SEM-005	106	17411	0.0997	4.5	2.1120	3.7	0.1832	1.3	1261	48	1105	13	1261	48	31.9
SEM-005	40	1782	0.0837	4.7	2.4970	3.8	0.2178	1.1	1272	17	1269.9	13	1272	17	0.2
SEM-005	99	15800	0.1023	4.6	2.4500	5.7	0.1979	3.2	1354	56	1185	33	1354	56	29.3
SEM-005	116	2434	0.0873	4.9	2.9750	4.0	0.2450	1.1	1360	21	1412	15	1360	21	-3.8
SEM-005	110	8769	0.1058	4.6	2.5900	6.6	0.2087	3.8	1360	64	1240	40	1360	64	28.3
SEM-005	84	12233	0.1052	4.7	2.8600	6.3	0.2276	3.5	1373	52	1341	43	1373	52	21.9
SEM-005	76	23922	0.0876	4.9	2.9180	4.1	0.2417	1.2	1379	19	1395	15	1379	19	-1.2
SEM-005	100	2370	0.0886	5.0	2.9980	4.3	0.2440	1.4	1400	24	1407	17	1400	24	-0.5
SEM-005	105	43225	0.0891	5.1	2.8650	2.5	0.2376	1.3	1410	32	1381	17	1410	32	2.7
SEM-005	115	4890	0.0899	4.8	3.1280	4.2	0.2498	1.2	1423	19	1437	16	1423	19	-1.0
SEM-005	112	5660	0.0903	4.8	2.9640	4.0	0.2382	1.3	1427	16	1377	17	1427	16	3.5
SEM-005	3	11260	0.0922	4.8	3.0740	3.9	0.2430	1.2	1460	20	1402	14	1460	20	4.0
SEM-005	114	7370	0.0964	4.7	3.5280	4.0	0.2631	1.1	1562	15	1505	16	1562	15	3.6
SEM-005	94	6400	0.1022	5.0	4.1340	2.2	0.2938	1.5	1642	35	1658	23	1642	35	-0.9
SEM-005	59	14725	0.1011	4.6	4.1570	3.8	0.2981	1.0	1651	14	1682	15	1651	14	-1.9
SEM-005	44	27690	0.1016	4.5	4.1610	0.9	0.2945	0.7	1656.2	7.2	1664	15	1656.2	7.2	-0.3
SEM-005	88	1534	0.1021	4.8	4.3130	3.9	0.3075	1.2	1660	16	1730	18	1660	16	-4.2
SEM-005	89	4538	0.1020	4.6	4.2510	3.8	0.3021	1.0	1660	13	1701	15	1660	13	-2.5
SEM-005	32	2007	0.1018	4.6	4.2140	3.8	0.3001	1.1	1664	12	1692	16	1664	12	-1.7
SEM-005	48	1824	0.1023	4.7	4.2250	3.8	0.2998	1.3	1672	12	1690	19	1672	12	-1.1
SEM-005	35	4909	0.1018	4.9	4.0410	2.4	0.2848	1.6	1674	23	1615	21	1674	23	2.8
SEM-005	119	14300	0.1027	4.7	4.3610	1.3	0.3065	0.8	1675	13	1722	17	1675	13	-2.7
SEM-005	30	2414	0.1031	5.0	4.3240	3.9	0.3017	1.3	1677	22	1699	20	1677	22	-1.3
SEM-005	22	1184	0.1040	5.3	4.2500	4.5	0.2971	1.6	1680	32	1676	23	1680	32	0.2
SEM-005	108	5486	0.1028	4.7	4.1780	1.1	0.2958	0.7	1681	11	1670	15	1681	11	0.8
SEM-005	101	107850	0.1032	4.6	4.1860	0.8	0.2943	0.6	1681.2	8.8	1662.6	15	1681.2	8.8	1.1
SEM-005	109	5908	0.1034	4.7	4.3570	1.3	0.3035	0.7	1682	14	1706	15	1682	14	-1.5
SEM-005	23	7918	0.1030	4.6	4.2550	3.8	0.2994	1.0	1683.5	8	1689.5	14	1683.5	8	-0.4
SEM-005	58	73300	0.1035	4.5	4.3380	1.1	0.3016	0.8	1685	11	1698	16	1685	11	-0.7
SEM-005	38	599	0.1029	5.0	4.2000	3.1	0.2966	1.5	1686	46	1672	21	1686	46	0.9
SEM-005	96	867	0.1040	4.8	4.3580	4.1	0.3034	1.3	1686	20	1708	18	1686	20	-1.3
SEM-005	46	94100	0.1033	4.6	4.1410	3.6	0.2930	1.1	1686	14	1656	17	1686	14	1.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-005	28	4145	0.1037	4.6	4.2680	3.7	0.3001	1.0	1689	12	1691	15	1689	12	-0.1
SEM-005	16	3203	0.1037	4.8	4.4900	2.2	0.3139	1.0	1690	33	1760	20	1690	33	-3.3
SEM-005	39	3576	0.1038	4.8	4.3670	3.9	0.3052	1.2	1690	19	1717	18	1690	19	-1.6
SEM-005	92	6827	0.1021	4.9	4.0720	1.9	0.2888	1.0	1690	29	1635	18	1690	29	1.9
SEM-005	21	2279	0.1029	4.8	4.1810	1.6	0.2979	1.0	1691	26	1682	18	1691	26	0.1
SEM-005	43	800	0.1056	5.2	4.3400	3.5	0.3010	1.3	1695	55	1703	22	1695	55	0.9
SEM-005	52	10330	0.1039	4.7	4.3490	3.9	0.3041	1.1	1695	14	1711	17	1695	14	-0.9
SEM-005	73	3076	0.1040	4.6	4.2660	3.8	0.2976	1.0	1696	11	1679.3	15	1696	11	1.0
SEM-005	103	2342	0.1037	5.0	4.3700	3.2	0.3100	1.5	1698	49	1742	24	1698	49	-3.4
SEM-005	20	6779	0.1040	4.5	4.2500	3.8	0.2979	1.0	1698.1	9.5	1680.9	15	1698.1	9.5	1.0
SEM-005	67	529	0.1078	5.9	4.2800	4.4	0.3057	2.1	1700	61	1731	31	1700	61	1.5
SEM-005	29	4957	0.1041	4.7	4.1570	1.6	0.2917	0.9	1701	21	1650	17	1701	21	2.4
SEM-005	66	17100	0.1044	4.7	4.3080	3.7	0.2982	1.0	1701	16	1682	14	1701	16	1.1
SEM-005	10	1894	0.1039	4.9	4.2340	4.0	0.2947	1.3	1702	19	1668	19	1702	19	2.0
SEM-005	47	4835	0.1045	4.7	4.3960	3.9	0.3051	1.1	1703	15	1716	17	1703	15	-0.8
SEM-005	13	652	0.1050	5.3	4.3200	3.5	0.3034	1.7	1705	60	1706	24	1705	60	1.4
SEM-005	72	913	0.1046	4.9	4.4130	3.9	0.3058	1.3	1705	21	1719	19	1705	21	-0.8
SEM-005	14	22900	0.1048	4.8	4.2990	4.0	0.2985	1.2	1706	14	1684	17	1706	14	1.3
SEM-005	69	1184	0.1037	5.0	4.2130	4.3	0.2945	1.5	1711	25	1663	21	1711	25	2.8
SEM-005	9	1705	0.1046	4.8	4.2480	3.8	0.2960	1.1	1716	19	1673	15	1716	19	2.5
SEM-005	68	32200	0.1035	4.7	4.3450	1.8	0.2992	1.0	1719	27	1688	17	1719	27	0.2
SEM-005	17	78700	0.1043	4.9	4.0550	1.5	0.2826	1.0	1720	17	1603	23	1720	17	5.7
SEM-005	24	4635	0.1047	4.7	4.4500	1.4	0.3031	0.9	1724	22	1706	17	1724	22	0.1
SEM-005	18	39300	0.1056	4.6	4.4690	3.8	0.3083	1.1	1724	11	1732	17	1724	11	-0.5
SEM-005	12	10819	0.1040	4.6	4.1510	1.3	0.2882	0.9	1727	20	1631	17	1727	20	4.2
SEM-005	74	359	0.1340	5.4	4.0500	3.2	0.2829	1.2	1728	52	1662	21	1728	52	22.3
SEM-005	36	20717	0.1058	4.6	4.4900	0.9	0.3083	0.7	1731	12	1732	15	1731	12	-0.3
SEM-005	8	8900	0.1061	4.6	4.4190	3.8	0.3027	1.0	1736	13	1705	15	1736	13	1.8
SEM-005	65	14490	0.1054	4.6	4.0670	1.4	0.2787	0.7	1740	18	1584	15	1740	18	7.5
SEM-005	71	7144	0.1070	4.7	4.2800	4.0	0.2909	1.3	1742	19	1647	19	1742	19	5.5
SEM-005	2	1555	0.1068	5.2	4.2800	4.4	0.2934	1.8	1743	30	1658	27	1743	30	4.9
SEM-005	102	17525	0.1063	4.7	4.6470	1.4	0.3137	0.9	1745	14	1757	17	1745	14	-0.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
SEM-005	91	1104	0.1094	5.2	4.6000	3.3	0.3099	1.7	1747	52	1749	23	1747	52	0.7
SEM-005	42	3684	0.1064	4.6	4.6940	1.3	0.3159	0.8	1748	12	1768	16	1748	12	-1.4
SEM-005	111	3159	0.1052	5.3	4.5280	1.8	0.3064	1.0	1751	23	1719	26	1751	23	-0.8
SEM-005	61	10407	0.1065	4.6	4.2140	1.8	0.2847	1.0	1752	23	1612	18	1752	23	6.8
SEM-005	104	989	0.1077	4.8	4.9100	3.9	0.3279	1.3	1760	48	1826	21	1760	48	-3.8
SEM-005	51	16100	0.1074	4.7	4.2740	1.4	0.2919	1.1	1761	20	1651	19	1761	20	6.0
SEM-005	95	16863	0.1070	4.7	4.9220	3.7	0.3257	1.1	1761	17	1820	17	1761	17	-3.4
SEM-005	27	9663	0.1083	4.6	4.6540	3.7	0.3123	1.0	1768	10	1752	16	1768	10	0.9
SEM-005	37	2507	0.1097	4.8	4.9240	1.9	0.3268	1.2	1788	24	1822	20	1788	24	-1.7
SEM-005	86	350000	0.1113	4.9	4.6300	1.9	0.3072	0.8	1824	25	1726	17	1824	25	5.3
SEM-005	4	9401	0.1289	4.6	6.7610	3.7	0.3817	0.9	2084.1	8.6	2085	17	2084.1	8.6	0.0
SEM-005	80	3563	0.1674	4.8	10.8000	3.9	0.4689	1.2	2540	20	2478	25	2540	20	2.4
TS-1	87	623	0.0524	7.4	0.0833	1.6	0.0129	2.6	57	21	82.92	2	82.92	2	67.0
TS-1	11	219	0.0568	7.6	0.0851	1.8	0.0132	2.7	51	23	84.86	2.1	84.86	2.1	85.3
TS-1	49	12155	0.0544	2.9	0.0919	4.0	0.0134	2.7	299	51	85.8	2.3	85.8	2.3	-5.6
TS-1	30	113	0.0479	8.4	0.0939	1.6	0.0147	2.8	33	17	94	2.4	94	2.4	78.5
TS-1	56	187	0.0496	6.9	0.0951	1.9	0.0147	2.9	57	26	94.9	2.5	94.9	2.5	68.9
TS-1	97	4490	0.1158	2.6	0.1240	4.5	0.0149	2.8	627	67	95.6	2.6	95.6	2.6	-1.3
TS-1	90	5062	0.1044	2.3	0.1081	6.2	0.0149	2.9	501	77	95.6	2.7	95.6	2.7	-2.6
TS-1	68	6750	0.0742	2.8	0.1076	4.5	0.0150	2.7	322	54	96	2.6	96	2.6	-3.4
TS-1	108	298	0.0497	7.8	0.0965	1.9	0.0150	2.9	51	24	96.2	2.7	96.2	2.7	80.4
TS-1	106	350000	0.0538	5.4	0.0981	1.8	0.0151	3.0	39	17	96.7	2.7	96.7	2.7	35.4
TS-1	46	6203	0.1058	2.2	0.1090	11.0	0.0152	3.5	736	77	97.2	3.4	97.2	3.4	-1.7
TS-1	84	860	0.0483	5.0	0.0977	2.1	0.0152	3.4	9.6	12	98.8	2.9	98.8	2.9	65.2
TS-1	107	357	0.0481	5.2	0.0987	2.1	0.0154	3.1	49	25	99.1	2.8	99.1	2.8	66.0
TS-1	61	519	0.0501	4.4	0.0990	2.9	0.0156	3.9	20	18	100	3.5	100	3.5	44.1
TS-1	23	733	0.0974	2.1	0.1036	2.2	0.0162	3.2	11.6	9.8	103.2	3.1	103.2	3.1	75.3
TS-1	67	2960	0.0522	3.6	0.1231	1.5	0.0188	2.7	76	28	120.4	3	120.4	3	26.8
TS-1	21	811	0.0512	3.5	0.1479	1.6	0.0228	2.9	61	23	145.8	3.7	145.8	3.7	4.9
TS-1	95	770	0.0485	4.7	0.1524	2.1	0.0229	2.8	94	30	146.1	3.6	146.1	3.6	76.5
TS-1	40	1143	0.0507	5.5	0.1458	2.5	0.0229	3.5	26	18	146.9	4.6	146.9	4.6	77.4
TS-1	74	1007	0.0492	4.3	0.1587	2.5	0.0249	3.5	9.7	7.8	159.6	4.8	159.6	4.8	67.9
TS-1	81	17582	0.0723	2.1	0.1763	5.3	0.0254	2.9	364	61	161.4	4.6	161.4	4.6	-1.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-1	52	2260	0.0531	4.7	0.2390	2.3	0.0359	2.8	112	35	229.1	5.7	229.1	5.7	77.5
TS-1	9	708	0.0496	3.8	0.2522	2.1	0.0375	2.6	121	33	237.7	5.9	237.7	5.9	62.7
TS-1	83	1214	0.0496	3.4	0.2541	2.6	0.0378	3.2	85	26	240.9	6.7	240.9	6.7	45.9
TS-1	88	173200	0.1035	2.0	0.2610	4.2	0.0368	2.5	331	47	232.7	5.8	331	47	-0.9
TS-1	7	489	0.0475	3.2	0.4000	5.0	0.0583	2.6	169	110	389.4	9.5	389.4	9.5	51.5
TS-1	10	8618	0.0820	2.2	0.5010	3.0	0.0672	2.5	397	34	419.1	10	419.1	10	0.6
TS-1	104	14920	0.1006	2.1	0.5289	2.6	0.0684	2.8	457.5	16	457.5	12	457.5	12	-4.9
TS-1	70	7344	0.1009	2.3	0.7235	1.5	0.0887	2.3	573.6	11	573.6	13	573.6	11	-4.4
TS-1	37	6648	0.0737	2.4	0.7575	2.8	0.0918	2.7	598.8	30	598.8	15	598.8	30	-3.1
TS-1	32	11211	0.0996	2.1	1.0350	2.0	0.1182	2.5	724	32	720.8	16	724	32	-2.8
TS-1	62	820	0.0744	3.0	1.4450	1.9	0.1508	2.5	913	31	905.8	20	913	31	-2.4
TS-1	82	8945	0.1023	2.2	1.4720	2.9	0.1511	2.8	964	47	915	22	964	47	-2.8
TS-1	39	7467	0.1042	2.2	1.6630	2.2	0.1680	2.4	989	21	1001.1	22	989	21	1.0
TS-1	73	5552	0.1038	2.1	1.8440	2.3	0.1814	2.6	1039	38	1075.1	24	1039	38	-1.3
TS-1	63	3271	0.0763	2.2	1.7310	2.3	0.1695	2.4	1044	27	1009.3	22	1044	27	-2.1
TS-1	4	18842	0.1027	2.0	1.7640	2.3	0.1725	2.4	1045	33	1025.7	23	1045	33	-1.7
TS-1	75	5536	0.1043	2.2	1.8710	2.9	0.1833	2.5	1049	35	1085.1	25	1049	35	2.3
TS-1	1	2891	0.0874	2.3	1.8420	2.4	0.1800	2.4	1063	29	1067.3	24	1063	29	-2.3
TS-1	113	5575	0.1036	2.5	1.9090	3.4	0.1852	2.8	1066	56	1098	25	1066	56	-1.3
TS-1	13	11122	0.0935	2.0	1.8020	2.3	0.1751	2.4	1069	31	1040.2	23	1069	31	-1.7
TS-1	89	12668	0.0891	2.1	1.8000	2.4	0.1726	2.4	1090	25	1026.4	23	1090	25	1.7
TS-1	94	13020	0.1018	2.1	1.8850	2.3	0.1810	2.5	1092	33	1073.2	24	1092	33	-0.7
TS-1	58	4638	0.0760	2.5	1.9930	2.1	0.1896	2.4	1097	34	1119.1	24	1097	34	-2.4
TS-1	103	4400	0.1012	2.6	1.9750	3.3	0.1869	2.7	1099	36	1104	28	1099	36	-0.1
TS-1	6	409	0.1060	4.3	1.9940	2.6	0.1869	2.5	1117	37	1106.6	25	1117	37	3.5
TS-1	102	7490	0.1026	2.3	2.0090	2.7	0.1905	2.6	1131	35	1123.7	25	1131	35	-1.3
TS-1	28	350000	0.0785	2.4	1.9770	2.1	0.1868	2.7	1137	30	1106.3	24	1137	30	0.5
TS-1	26	4323	0.1017	2.1	2.1030	2.6	0.1943	2.4	1139	44	1143.7	25	1139	44	-0.4
TS-1	119	3020	0.0745	2.3	2.0860	2.6	0.1929	2.5	1170	48	1138	25	1170	48	-1.0
TS-1	45	10073	0.1020	2.1	2.2010	2.0	0.2000	2.3	1195.7	25	1175.3	25	1195.7	25	-0.3
TS-1	54	59760	0.0757	2.2	2.4110	2.2	0.2117	2.4	1245	27	1237.9	27	1245	27	5.8
TS-1	85	41483	0.2374	1.9	2.5380	3.9	0.2094	2.7	1383	86	1228.7	28	1383	86	-0.1
TS-1	115	2858	0.0636	2.2	2.9800	2.2	0.2435	2.4	1386	37	1406.1	30	1386	37	0.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-1	55	64915	0.1018	2.1	2.8390	4.2	0.2356	3.1	1399	62	1362	32	1399	62	0.0
TS-1	15	34417	0.1000	2.0	2.8690	2.1	0.2353	2.4	1403.7	23	1361.3	29	1403.7	23	0.3
TS-1	43	312000	0.0904	2.0	2.9350	2.2	0.2396	2.3	1409	24	1384.8	29	1409	24	12.2
TS-1	86	2328	0.1026	2.4	2.9730	2.6	0.2409	2.6	1416	41	1391	30	1416	41	-0.8
TS-1	110	12282	0.1029	2.2	3.0900	7.4	0.2453	3.3	1485	90	1439	35	1485	90	0.8
TS-1	101	5858	0.0775	2.7	3.4260	2.1	0.2672	2.3	1501.5	22	1526.3	32	1501.5	22	2.1
TS-1	8	1778	0.1027	2.6	3.9320	2.1	0.2842	2.4	1617.3	21	1612.8	33	1617.3	21	1.2
TS-1	117	10696	0.0742	2.3	4.1250	2.3	0.2960	2.4	1626	25	1669.7	35	1626	25	2.2
TS-1	64	107483	0.1158	1.9	4.2470	2.3	0.3047	2.4	1636.3	22	1713	36	1636.3	22	4.0
TS-1	116	6007	0.1654	2.1	4.2360	2.6	0.3042	2.5	1637	36	1711	36	1637	36	3.7
TS-1	16	7516	0.0798	2.0	4.0280	3.0	0.2912	2.5	1638	40	1647	35	1638	40	1.7
TS-1	25	1625	0.1030	2.7	4.1600	2.2	0.2941	2.4	1656	24	1662.1	35	1656	24	1.1
TS-1	51	2135	0.0996	3.1	4.1450	2.1	0.2933	2.4	1660	26	1658.2	34	1660	26	-1.3
TS-1	111	4174	0.1039	2.2	4.0890	3.4	0.2905	2.8	1662	47	1645	36	1662	47	1.7
TS-1	50	27920	0.0749	2.1	4.1840	2.2	0.2959	2.5	1665	25	1670.6	35	1665	25	3.1
TS-1	71	1342	0.1044	2.0	4.3160	2.2	0.3034	2.4	1666	25	1708	35	1666	25	65.0
TS-1	44	17425	0.0739	2.2	4.2120	2.2	0.2989	2.3	1667.2	23	1684.2	35	1667.2	23	3.8
TS-1	48	16752	0.1032	2.1	4.0560	2.2	0.2877	2.4	1667.5	21	1629.4	34	1667.5	21	1.9
TS-1	105	5033	0.1162	2.2	4.3050	2.2	0.3019	2.4	1670	22	1699.7	35	1670	22	4.8
TS-1	91	2232	0.0885	3.6	4.1490	2.1	0.2936	2.4	1673.9	24	1659.4	34	1673.9	24	2.9
TS-1	96	11563	0.0777	2.3	4.1910	2.4	0.2952	2.4	1676	23	1666.3	35	1676	23	3.3
TS-1	17	2732	0.0696	2.4	3.4920	2.5	0.2459	2.4	1677	53	1425.3	30	1677	53	1.8
TS-1	80	20450	0.0774	2.5	4.0250	2.4	0.2835	2.5	1677	35	1609.8	34	1677	35	2.3
TS-1	27	2313	0.1030	2.6	4.2280	2.4	0.2976	2.5	1678	24	1679.5	35	1678	24	2.5
TS-1	47	3044	0.0519	4.4	4.2860	2.1	0.3008	2.4	1680.4	20	1695.1	36	1680.4	20	70.2
TS-1	57	1464	0.1078	2.3	4.3040	3.7	0.3016	2.8	1681	43	1698	38	1681	43	18.2
TS-1	66	42150	0.1028	2.0	3.9230	2.8	0.2791	2.7	1681	34	1587	38	1681	34	0.7
TS-1	69	1116	0.0769	2.7	4.1400	2.2	0.2923	2.4	1682	25	1650	35	1682	25	2.6
TS-1	42	1340	0.0511	4.3	4.1690	2.3	0.2920	2.4	1690	21	1651	34	1690	21	29.7
TS-1	76	5440	0.1026	2.2	4.3450	2.2	0.3026	2.4	1693	26	1704.3	36	1693	26	5.3
TS-1	31	2210	0.0951	2.1	4.2920	2.8	0.2995	2.6	1695	42	1684	37	1695	42	62.5
TS-1	20	4591	0.1031	2.1	4.2870	2.8	0.3023	2.6	1695	37	1700	37	1695	37	3.7
TS-1	29	3561	0.0763	2.5	4.0900	3.9	0.2898	3.0	1697	51	1645	36	1697	51	3.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-1	59	1958	0.0783	2.6	4.1900	4.1	0.2930	3.0	1699	56	1660	39	1699	56	0.1
TS-1	22	16467	0.0888	2.0	4.2020	2.4	0.2955	2.5	1699	30	1666	36	1699	30	2.9
TS-1	36	264	0.0512	5.3	4.2700	2.2	0.2982	2.4	1700	25	1682.2	35	1700	25	55.7
TS-1	72	3958	0.1969	2.5	4.1400	3.1	0.2923	2.8	1700	42	1656	37	1700	42	2.1
TS-1	78	449	0.0524	6.3	4.4870	2.2	0.3134	2.5	1712	28	1757	38	1712	28	80.9
TS-1	33	566	0.0499	4.2	4.2870	2.6	0.2960	2.5	1716	27	1671	37	1716	27	71.3
TS-1	114	828	0.0607	4.8	4.6380	2.2	0.3157	2.4	1738	23	1768	37	1738	23	84.8
TS-1	34	3452	0.1886	2.1	5.1700	2.7	0.3296	2.5	1846	35	1837	38	1846	35	7.5
TS-1	79	90	0.0527	11.4	5.4710	2.6	0.3441	2.5	1881	31	1906	41	1881	31	86.8
TS-1	60	5802	0.0901	2.0	5.2170	1.9	0.3258	2.4	1894.5	24	1818.2	38	1894.5	24	13.8
TS-1	12	466	0.1095	2.1	5.1170	2.3	0.3233	2.4	1902	31	1806	38	1902	31	74.4
TS-1	35	7395	0.1135	2.0	10.2840	2.5	0.4543	2.4	2504	25	2415	48	2504	25	10.5
TS-1	93	4429	0.1084	1.9	14.1000	2.8	0.5294	2.6	2793	39	2738	59	2793	39	19.5
TS-1	14	22600	0.1022	2.0	20.1680	2.1	0.6192	2.3	3105	21	3106	58	3105	21	17.5
TS-3	20	673	0.0486	6.4	0.0851	6.5	0.0127	2.1	375	68	81.3	1.7	81.3	1.7	78.3
TS-3	71	581	0.0484	4.8	0.0870	1.7	0.0135	2.0	42	25	86.9	1.6	86.9	1.6	68.1
TS-3	27	615	0.0486	4.5	0.0952	4.0	0.0141	1.8	197	40	90.43	1.6	90.43	1.6	54.1
TS-3	88	2380	0.0492	5.1	0.0985	4.5	0.0146	1.9	247	51	93.1	1.8	93.1	1.8	62.3
TS-3	63	2252	0.0480	4.6	0.0957	4.1	0.0146	1.9	208	50	93.3	1.8	93.3	1.8	55.1
TS-3	52	183	0.0620	6.6	0.0930	3.1	0.0146	3.0	50	32	94.9	2.8	94.9	2.8	85.8
TS-3	83	88	0.0448	9.6	0.0955	3.2	0.0150	3.5	15	14	95.6	3.1	95.6	3.1	75.7
TS-3	120	2075	0.0497	8.7	0.1030	8.2	0.0150	2.5	503	88	96	2.3	96	2.3	80.9
TS-3	43	304	0.0477	8.4	0.0994	8.5	0.0151	2.6	428	90	96.4	2.5	96.4	2.5	77.5
TS-3	84	115	0.0470	11.1	0.0961	4.0	0.0150	3.9	21	22	96.6	3.2	96.6	3.2	76.4
TS-3	92	1402	0.0492	5.1	0.1051	2.3	0.0162	2.2	59	34	103.7	2	103.7	2	60.3
TS-3	57	350000	0.0496	4.8	0.1447	2.6	0.0221	2.2	104	41	141.4	3	141.4	3	46.2
TS-3	111	2770	0.0516	6.6	0.1459	2.3	0.0226	2.6	43	23	144.9	3.3	144.9	3.3	60.8
TS-3	89	743	0.0461	17.1	0.1526	4.9	0.0237	5.5	19	21	151.4	7.7	151.4	7.7	73.0
TS-3	82	71	0.0469	11.7	0.1670	11.4	0.0260	3.7	514	100	165.1	6.1	165.1	6.1	67.9
TS-3	53	1156	0.0495	5.1	0.1779	1.7	0.0273	2.0	64	28	174.2	3.1	174.2	3.1	38.9
TS-3	22	8733	0.0504	4.0	0.2434	3.7	0.0350	1.7	264	47	221.7	3.7	221.7	3.7	16.0
TS-3	28	709	0.0517	5.2	0.2900	4.8	0.0407	1.9	378	70	257	4.9	257	4.9	32.0
TS-3	39	230	0.0648	7.3	0.4660	7.3	0.0535	3.7	826	92	336	12	336	12	59.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-3	101	448	0.0531	5.1	0.3864	2.6	0.0549	2.0	235	54	346.2	6.4	346.2	6.4	18.9
TS-3	34	5491	0.0537	4.3	0.4740	3.2	0.0656	2.0	268	60	410.4	7.2	410.4	7.2	-11.8
TS-3	72	74500	0.0553	4.2	0.4780	3.1	0.0658	2.0	306	60	413.6	7	413.6	7	6.6
TS-3	115	4190	0.0545	7.5	0.4930	6.9	0.0675	3.0	442	82	421	12	421	12	4.8
TS-3	6	4750	0.0556	4.3	0.5220	3.8	0.0680	1.8	450	53	423.8	7.3	423.8	7.3	5.8
TS-3	69	1537	0.0564	3.9	0.5540	3.6	0.0710	1.8	473	59	442.4	7.8	442.4	7.8	6.5
TS-3	75	1715	0.1022	3.1	0.5930	6.9	0.0751	5.2	526	74	494	25	494	25	70.3
TS-3	94	1379	0.0598	4.0	0.8480	3.2	0.1038	1.9	559	59	639.4	12	559	59	-7.1
TS-3	106	2857	0.0608	4.1	0.7300	2.9	0.0909	2.1	548	60	564.9	11	564.9	11	10.5
TS-3	93	831	0.1085	3.6	0.7180	11.7	0.0868	8.8	524	120	568	47	568	47	68.0
TS-3	90	20680	0.0976	3.2	0.8510	5.2	0.1029	3.7	659	69	659	23	659	69	58.4
TS-3	112	8950	0.0680	3.5	1.2620	3.0	0.1355	1.5	854	46	819.1	12	854	46	4.1
TS-3	50	802	0.0713	3.9	1.6210	2.9	0.1627	2.0	953	55	975	17	953	55	0.0
TS-3	23	5782	0.0998	3.2	1.5310	3.1	0.1557	1.8	965.3	22	965.3	15	965.3	22	40.7
TS-3	7	6252	0.1006	3.1	1.5930	4.0	0.1599	1.9	990	44	990	17	990	44	39.6
TS-3	48	27250	0.0735	3.4	1.7770	2.9	0.1741	1.7	1023	34	1035.2	16	1023	34	-1.2
TS-3	46	13450	0.0745	3.5	1.7090	3.5	0.1681	1.9	1049	52	1002	17	1049	52	4.8
TS-3	32	876	0.0754	3.8	1.8710	3.4	0.1793	1.8	1073	39	1063	17	1073	39	0.9
TS-3	95	4300	0.0753	3.3	1.9070	2.8	0.1830	1.6	1074	36	1083.4	16	1074	36	-0.9
TS-3	19	5250	0.0761	3.4	1.8900	2.9	0.1792	1.7	1097	40	1062.3	16	1097	40	3.2
TS-3	78	9597	0.0784	3.7	1.8500	3.6	0.1753	2.0	1120	56	1045	17	1120	56	10.1
TS-3	44	43100	0.1042	3.2	2.0410	5.4	0.1884	2.6	1144	73	1148	25	1144	73	32.4
TS-3	105	3488	0.0787	3.2	2.0950	2.7	0.1933	1.5	1162	36	1139.1	16	1162	36	2.0
TS-3	118	22700	0.0788	3.2	2.0400	2.6	0.1873	1.5	1163	39	1106.7	16	1163	39	4.8
TS-3	10	597	0.0827	4.5	2.3760	3.6	0.2143	2.4	1205	68	1257	24	1205	68	-0.1
TS-3	1	5710	0.0863	5.0	2.4900	5.2	0.2221	2.7	1249	74	1305	29	1249	74	3.1
TS-3	86	1685	0.0852	3.5	2.6090	3.0	0.2194	1.7	1336	37	1280	20	1336	37	4.2
TS-3	61	3550	0.0860	3.8	2.7670	3.6	0.2313	2.0	1357	62	1344	23	1357	62	1.0
TS-3	5	166300	0.0879	3.2	2.8970	2.8	0.2369	1.6	1379	44	1370.3	19	1379	44	0.7
TS-3	81	1611	0.0883	3.4	2.8780	3.0	0.2357	1.7	1392	41	1364	21	1392	41	2.0
TS-3	51	9717	0.0887	3.4	3.0200	2.7	0.2453	1.6	1395	37	1413.1	20	1395	37	-1.8
TS-3	33	2631	0.0889	3.5	3.0940	2.9	0.2520	1.8	1401	30	1448	23	1401	30	-3.4
TS-3	25	2567	0.0927	3.6	3.1150	3.5	0.2420	2.2	1474	38	1398	28	1474	38	5.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-3	109	18150	0.0927	3.5	3.2500	2.9	0.2535	1.7	1491	36	1456	21	1491	36	2.3
TS-3	58	2988	0.0953	3.4	3.3950	2.9	0.2584	1.6	1543	30	1481.3	21	1543	30	4.0
TS-3	13	5336	0.0975	3.3	3.5740	2.8	0.2650	1.6	1568	41	1515	22	1568	41	3.4
TS-3	36	42095	0.1008	3.3	4.0110	2.7	0.2882	1.6	1636	33	1632	23	1636	33	0.2
TS-3	24	531	0.0993	4.8	3.9800	7.0	0.2919	3.2	1644	110	1650	38	1644	110	-3.4
TS-3	15	8408	0.1017	3.2	4.0990	2.7	0.2909	1.5	1660	40	1647.2	23	1660	40	0.4
TS-3	45	1929	0.1044	3.7	4.1100	4.4	0.2932	2.3	1661	67	1662	30	1661	67	2.5
TS-3	116	2039	0.1021	3.3	4.1180	2.9	0.2935	1.6	1665	30	1659	24	1665	30	0.4
TS-3	113	350000	0.1042	3.5	4.1600	4.3	0.2930	1.9	1666	69	1656	26	1666	69	2.0
TS-3	37	19330	0.1023	3.2	4.1640	2.6	0.2955	1.6	1667	43	1668.4	23	1667	43	0.0
TS-3	56	2438	0.1033	3.3	3.9990	4.0	0.2812	2.3	1679	85	1598	33	1679	85	5.7
TS-3	59	26350	0.1037	3.5	4.2580	3.1	0.2980	1.8	1681	35	1681	26	1681	35	0.0
TS-3	8	350000	0.1022	3.3	4.3900	2.7	0.3072	1.8	1682	46	1725	26	1682	46	-2.9
TS-3	54	10960	0.1033	3.1	4.2700	2.8	0.2988	1.9	1685.9	33	1687	29	1685.9	33	-0.1
TS-3	96	1866	0.1036	3.8	4.4550	3.4	0.3072	1.9	1686	44	1729	28	1686	44	-2.6
TS-3	11	14017	0.1032	3.2	4.0100	3.2	0.2796	2.3	1688	33	1588	32	1688	33	5.9
TS-3	98	12983	0.1037	3.2	4.2620	2.8	0.2961	1.6	1689	32	1671.6	23	1689	32	1.0
TS-3	29	16250	0.1035	3.6	4.2280	3.3	0.2938	1.8	1692	40	1664	26	1692	40	1.7
TS-3	38	7188	0.1035	3.2	4.3060	3.0	0.2992	1.6	1693	42	1688.9	23	1693	42	-0.1
TS-3	91	29033	0.1039	3.2	4.3170	3.7	0.3036	1.6	1693	41	1710	24	1693	41	-0.9
TS-3	73	3358	0.1033	3.4	4.2260	3.3	0.2973	1.8	1695	44	1678	25	1695	44	0.7
TS-3	64	5278	0.1041	3.4	4.2200	2.8	0.2932	1.7	1699	47	1657	24	1699	47	2.2
TS-3	42	4250	0.1032	3.2	4.1440	2.9	0.2893	1.6	1700	50	1636.7	22	1700	50	2.8
TS-3	110	18240	0.1036	3.2	4.2530	2.6	0.2957	1.6	1701.4	31	1669.8	23	1701.4	31	1.9
TS-3	103	17675	0.1047	3.2	4.1460	2.9	0.2848	1.7	1702	32	1615	24	1702	32	5.1
TS-3	76	95100	0.1033	3.2	4.1070	3.2	0.2846	1.6	1703	60	1612	23	1703	60	4.5
TS-3	30	1056	0.1033	3.6	4.2830	3.0	0.2962	1.8	1706	51	1674	24	1706	51	0.7
TS-3	100	1383	0.1041	3.5	4.2700	3.0	0.2979	1.9	1707	30	1680	28	1707	30	1.6
TS-3	102	7013	0.1044	3.3	4.3380	2.8	0.2986	1.6	1708	38	1684.3	23	1708	38	1.4
TS-3	41	10133	0.1040	3.5	4.3150	3.0	0.2991	1.6	1711	36	1686	24	1711	36	1.5
TS-3	79	5164	0.1050	3.2	4.1260	2.7	0.2853	1.6	1712	32	1617.6	23	1712	32	5.5
TS-3	70	1118	0.1046	4.1	4.2300	4.5	0.2943	2.4	1717	72	1673	29	1717	72	1.6
TS-3	60	9122	0.1050	3.1	4.7080	3.0	0.3216	1.6	1718	39	1797.9	24	1718	39	-4.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-3	119	6694	0.1060	3.2	4.3720	3.0	0.2984	1.8	1735	36	1683	27	1735	36	3.0
TS-3	16	15660	0.1062	3.2	4.4500	2.7	0.3030	1.6	1737	44	1705.8	24	1737	44	1.3
TS-3	99	27310	0.1070	3.3	4.3910	2.7	0.2972	1.6	1740	37	1680	25	1740	37	3.4
TS-3	3	7683	0.1081	3.1	4.7230	3.0	0.3166	1.8	1759.7	31	1775	29	1759.7	31	-0.9
TS-3	67	47650	0.1073	3.4	4.6170	2.8	0.3090	1.6	1760	35	1736	24	1760	35	1.4
TS-3	4	644	0.1089	3.9	4.6900	3.4	0.3121	1.8	1780	40	1751	28	1780	40	1.6
TS-3	18	4317	0.1096	3.3	4.6830	2.8	0.3093	1.7	1795	37	1737	26	1795	37	3.2
TS-3	17	350000	0.1132	3.2	5.1140	2.7	0.3279	1.6	1853	39	1828	25	1853	39	1.2
TS-3	40	20380	0.1182	3.7	5.4800	3.3	0.3351	1.9	1925	38	1863	30	1925	38	3.2
TS-3	49	1983	0.1916	3.3	14.1200	2.8	0.5346	1.7	2766	30	2763	40	2766	30	0.1
TS-3	85	106233	0.1959	3.1	14.2600	2.7	0.5253	1.5	2793.3	31	2721	34	2793.3	31	2.6
TS-5	72	2493	0.0491	6.3	0.0988	6.0	0.0143	1.7	353	82	91.8	1.6	91.8	1.6	74.0
TS-5	68	1481	0.0485	3.9	0.0985	4.0	0.0147	1.4	233	42	94.2	1.3	94.2	1.3	59.6
TS-5	113	1947	0.0457	6.1	0.0947	5.7	0.0149	1.9	286	55	95	1.8	95	1.8	66.8
TS-5	122	1264	0.0491	4.7	0.0966	1.9	0.0150	1.7	36	20	96.4	1.6	96.4	1.6	73.7
TS-5	131	382	0.0870	6.8	0.0936	1.7	0.0146	1.7	10	11	99.4	1.7	99.4	1.7	92.0
TS-5	114	550	0.0482	6.2	0.0998	1.7	0.0156	1.7	36	20	99.8	1.7	99.8	1.7	64.7
TS-5	74	558	0.0594	4.7	0.0996	2.2	0.0156	1.9	24	15	101.7	1.9	101.7	1.9	82.5
TS-5	73	1120	0.0535	6.0	0.1041	1.9	0.0161	1.8	59	25	104.3	1.8	104.3	1.8	78.8
TS-5	28	7363	0.0499	2.4	0.1471	1.9	0.0219	1.1	134	30	139.81	1.4	139.81	1.4	21.5
TS-5	2	48	0.2990	10.4	0.1001	3.5	0.0156	3.1	28	23	152	11	152	11	95.5
TS-5	35	1660	0.0524	5.9	0.1910	5.8	0.0262	1.8	466	86	167	2.9	167	2.9	64.2
TS-5	100	6752	0.0506	2.8	0.2410	2.3	0.0352	1.3	179	37	222.9	2.8	222.9	2.8	5.1
TS-5	41	1107	0.0558	2.7	0.3653	3.3	0.0507	1.6	300	58	319.3	4.8	319.3	4.8	27.3
TS-5	118	90	0.0590	8.3	0.4200	5.2	0.0563	4.4	355	33	354	15	354	15	49.4
TS-5	45	362	0.0823	4.3	0.4110	10.7	0.0585	5.6	227	50	380.2	14	380.2	14	69.4
TS-5	48	5700	0.0543	2.8	0.4866	2.7	0.0655	1.3	330	48	409.7	4.6	409.7	4.6	-7.8
TS-5	19	18333	0.0547	2.4	0.5002	2.6	0.0667	1.2	396	40	416.4	4.5	416.4	4.5	0.4
TS-5	96	682	0.0609	4.1	0.4960	2.8	0.0682	1.4	305	57	429.3	5.7	429.3	5.7	27.0
TS-5	117	3960	0.0560	2.7	0.5289	2.5	0.0699	1.3	410	40	436.4	5.2	436.4	5.2	1.5
TS-5	126	42520	0.0573	2.4	0.5594	2.0	0.0719	1.2	476	35	448.5	4.7	448.5	4.7	13.1
TS-5	109	2638	0.0583	3.9	0.6060	2.3	0.0785	1.7	428	50	489.2	6.8	489.2	6.8	14.0
TS-5	14	4006	0.0646	2.5	0.7240	3.0	0.0870	1.7	637	45	540.4	9.2	540.4	9.2	29.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-5	94	2657	0.0596	3.7	0.7180	3.1	0.0896	1.7	463	60	555.2	8.1	555.2	8.1	3.6
TS-5	123	1070	0.0636	4.1	0.7260	3.0	0.0892	1.9	617	41	555.6	9.3	555.6	9.3	22.2
TS-5	98	5590	0.0593	2.4	0.8320	2.3	0.1012	1.1	581	33	622.7	6.3	581	33	-6.3
TS-5	85	2750	0.0600	3.3	0.8510	3.4	0.1026	1.4	598	46	629.3	8.2	598	46	-5.2
TS-5	89	8022	0.0609	2.5	0.7886	2.2	0.0959	1.1	607	28	590.3	6.4	607	28	3.9
TS-5	88	1547	0.0611	3.3	0.8390	3.2	0.0994	1.4	638	46	610.8	8	638	46	4.3
TS-5	46	8809	0.0639	2.2	1.0730	2.2	0.1213	1.2	734	31	738.4	8.1	734	31	-0.1
TS-5	70	6885	0.0947	2.0	1.0370	3.0	0.1173	1.4	742.9	31	742.9	9.5	742.9	31	51.1
TS-5	97	11008	0.0718	2.5	1.6970	2.5	0.1703	1.2	986	27	1013.7	11	986	27	-2.8
TS-5	108	11600	0.0726	2.3	1.6640	2.5	0.1659	1.3	997	32	989.4	11	997	32	1.7
TS-5	25	350000	0.0727	2.2	1.7300	2.1	0.1716	1.0	1005	31	1020.6	9.8	1005	31	-1.8
TS-5	120	5825	0.0735	2.6	1.7230	3.7	0.1695	1.9	1025	41	1009	18	1025	41	1.8
TS-5	42	9100	0.0738	2.3	1.7040	2.1	0.1672	1.1	1038	32	996.6	9.5	1038	32	3.9
TS-5	80	11333	0.0745	2.4	1.8600	2.5	0.1804	1.1	1056	30	1069.2	10	1056	30	-1.3
TS-5	18	2664	0.0729	3.2	1.8530	3.7	0.1817	1.7	1073	57	1075	15	1073	57	-4.9
TS-5	140	3974	0.0747	2.1	1.7710	2.2	0.1726	1.0	1074	33	1026.3	9.7	1074	33	2.7
TS-5	22	18263	0.0759	2.4	1.9250	2.4	0.1837	1.1	1091	25	1087	11	1091	25	0.4
TS-5	10	2009	0.0799	2.4	1.8870	2.0	0.1807	1.1	1103	32	1075	9.9	1103	32	9.6
TS-5	83	33200	0.0771	2.1	2.0350	2.2	0.1914	1.0	1120.2	25	1128.8	10	1120.2	25	-0.8
TS-5	115	6155	0.1047	2.0	1.9430	2.8	0.1833	1.1	1120.8	26	1120.8	11	1120.8	26	34.4
TS-5	8	5319	0.0787	2.5	2.1760	2.6	0.2007	1.1	1163	29	1179.1	12	1163	29	-1.4
TS-5	86	10545	0.0788	2.2	2.1780	2.2	0.2003	1.0	1170	25	1176.9	11	1170	25	-0.6
TS-5	12	7633	0.0805	2.6	2.2800	3.9	0.2041	2.2	1209	41	1197	23	1209	41	1.0
TS-5	102	4006	0.0809	2.2	2.1890	2.5	0.1959	1.3	1218	27	1153	14	1218	27	5.3
TS-5	43	19500	0.0813	2.1	2.4100	2.2	0.2151	1.1	1221.7	22	1255.6	12	1221.7	22	-2.8
TS-5	101	13867	0.1025	2.0	2.5700	7.4	0.2121	3.6	1301	150	1260	37	1301	150	24.5
TS-5	16	11283	0.0862	2.4	2.7460	2.4	0.2309	1.2	1340	28	1339	14	1340	28	0.1
TS-5	90	49250	0.0874	2.1	2.9510	2.2	0.2449	1.1	1369	22	1411.9	13	1369	22	-3.1
TS-5	4	4933	0.0879	2.4	2.6800	3.7	0.2251	1.4	1370	40	1312	16	1370	40	4.7
TS-5	33	5117	0.0874	2.3	3.1860	2.8	0.2568	1.1	1405	40	1472	14	1405	40	-7.5
TS-5	62	11288	0.0901	2.3	2.9730	3.0	0.2392	1.5	1439	38	1385	18	1439	38	3.3
TS-5	54	7000	0.0906	2.1	3.2000	2.3	0.2562	1.1	1440	26	1470.9	13	1440	26	-2.3
TS-5	76	15429	0.0914	2.2	3.2600	2.4	0.2581	1.2	1453	30	1479.8	16	1453	30	-1.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-5	93	55070	0.0925	2.4	3.2120	2.5	0.2537	1.1	1465	29	1457	15	1465	29	0.5
TS-5	132	34600	0.0917	2.3	3.1710	2.4	0.2508	1.1	1467	30	1442.5	13	1467	30	0.9
TS-5	78	21111	0.0927	2.0	3.3220	2.4	0.2590	1.1	1476.3	27	1483.5	15	1476.3	27	-0.3
TS-5	64	50600	0.0970	2.1	3.6910	2.2	0.2750	1.1	1570.1	28	1565.9	15	1570.1	28	0.3
TS-5	67	7350	0.0984	2.4	3.8010	2.5	0.2775	1.2	1593	28	1580	16	1593	28	0.8
TS-5	137	8417	0.0999	2.4	3.9060	2.8	0.2833	1.6	1621	49	1604	23	1621	49	0.4
TS-5	9	115000	0.1003	2.1	4.0690	2.2	0.2940	1.0	1628.8	21	1661.6	15	1628.8	21	-2.0
TS-5	128	23558	0.1011	2.2	4.1600	2.4	0.2971	1.1	1647	26	1676	17	1647	26	-1.9
TS-5	32	20000	0.1010	2.1	4.1080	2.1	0.2944	1.0	1650.8	23	1662.3	15	1650.8	23	-0.8
TS-5	110	20455	0.1017	2.1	4.1270	2.2	0.2946	1.0	1654	25	1664.2	14	1654	25	-0.5
TS-5	5	11050	0.1024	2.3	3.9200	2.8	0.2804	1.2	1656	42	1596	17	1656	42	4.1
TS-5	107	4745	0.1021	2.2	3.9830	2.5	0.2855	1.2	1656.4	24	1621	16	1656.4	24	2.4
TS-5	61	2956	0.1028	2.5	4.3690	2.5	0.3062	1.4	1659	27	1721	21	1659	27	-3.7
TS-5	24	18267	0.1021	2.4	4.1900	3.3	0.2981	2.3	1662	25	1684	34	1662	25	-1.3
TS-5	26	84000	0.1023	2.1	4.1790	2.3	0.2959	1.2	1664.3	25	1670	17	1664.3	25	-0.3
TS-5	56	76125	0.1023	2.1	4.2210	2.3	0.2982	1.4	1668.7	26	1682	21	1668.7	26	-0.8
TS-5	17	3840	0.1027	2.3	4.1160	2.4	0.2906	1.2	1669	36	1646	16	1669	36	1.0
TS-5	21	42333	0.1026	2.1	4.0820	2.2	0.2885	1.1	1670.8	26	1634	16	1670.8	26	2.1
TS-5	112	4778	0.1031	2.1	4.3100	2.3	0.3042	1.3	1672	27	1712.1	19	1672	27	-2.3
TS-5	59	16952	0.1027	2.0	4.2380	2.2	0.2982	1.1	1672.1	23	1682.5	16	1672.1	23	-0.6
TS-5	30	8667	0.1029	2.1	4.2360	2.2	0.2981	1.1	1675.5	21	1682.1	16	1675.5	21	-0.4
TS-5	130	7625	0.1033	2.1	4.1210	2.4	0.2904	1.1	1680	25	1644.8	16	1680	25	2.3
TS-5	37	4433	0.1036	2.3	4.4800	2.7	0.3110	1.2	1681	35	1743	18	1681	35	-2.9
TS-5	49	10675	0.1026	2.2	4.4830	2.5	0.3114	1.2	1682	29	1744	17	1682	29	-4.4
TS-5	75	123000	0.1032	2.0	4.1430	2.3	0.2896	1.2	1685.1	25	1639	17	1685.1	25	2.7
TS-5	77	19429	0.1036	2.1	4.2700	2.2	0.2986	1.0	1685.5	25	1684.2	15	1685.5	25	0.1
TS-5	134	11636	0.1034	2.1	4.4010	2.3	0.3069	1.2	1693	27	1726	18	1693	27	-2.5
TS-5	65	19400	0.1039	2.0	4.2690	2.2	0.2980	1.0	1693.1	22	1681.3	15	1693.1	22	0.7
TS-5	138	6318	0.1042	2.1	4.2050	2.4	0.2929	1.1	1701.6	25	1656	16	1701.6	25	2.5
TS-5	13	16875	0.1047	2.1	4.2680	2.2	0.2953	1.1	1712	30	1668.2	16	1712	30	2.2
TS-5	133	18278	0.1053	2.0	4.4500	2.2	0.3053	1.0	1719.9	20	1717.6	16	1719.9	20	0.2
TS-5	105	139250	0.1068	2.1	4.4540	2.1	0.3017	1.0	1749.5	24	1699.8	15	1749.5	24	2.8
TS-5	66	236000	0.1074	2.0	4.7700	2.1	0.3219	1.1	1755.8	20	1798.7	16	1755.8	20	-2.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-5	40	10486	0.1212	2.2	5.7490	2.3	0.3426	1.2	1979.9	24	1899	19	1979.9	24	4.1
TS-5	29	50000	0.1838	2.1	13.6200	2.2	0.5377	1.1	2686.1	19	2774	24	2686.1	19	-3.3
TS-5	99	29600	0.1839	2.0	13.8250	2.3	0.5430	1.0	2688.6	24	2795	23	2688.6	24	-4.0
TS-5	84	107800	0.1882	2.0	13.5380	2.1	0.5198	1.0	2726.1	22	2700	23	2726.1	22	1.0
TS-5	51	8923	0.1910	2.1	14.1900	2.3	0.5376	1.0	2748	22	2773	24	2748	22	-0.8
TS-5	136	53500	0.1957	2.2	14.3500	2.4	0.5305	1.2	2797	34	2745	27	2797	34	1.7
TS-6	105	237	0.0495	8.3	0.0898	7.8	0.0131	2.9	437	77	83.9	2.4	83.9	2.4	80.8
TS-6	33	477	0.0483	5.4	0.0873	4.9	0.0131	2.5	302	70	84.1	2.1	84.1	2.1	72.2
TS-6	87	222	0.0478	8.6	0.0945	7.6	0.0138	2.9	416	65	88.6	2.6	88.6	2.6	78.7
TS-6	100	3220	0.0609	13.5	0.1157	23.3	0.0139	5.2	770	160	89.1	4.6	89.1	4.6	88.4
TS-6	124	383	0.0504	6.3	0.0924	2.8	0.0143	3.0	56	28	91.5	2.6	91.5	2.6	78.3
TS-6	20	606	0.0516	6.2	0.1021	5.7	0.0146	2.4	409	65	93.4	2.2	93.4	2.2	77.2
TS-6	11	1680	0.0483	5.4	0.0968	1.7	0.0152	2.4	29	15	97.1	2.2	97.1	2.2	71.7
TS-6	116	169	0.0543	11.2	0.1120	10.7	0.0153	3.7	700	110	97.6	3.6	97.6	3.6	86.1
TS-6	122	817	0.0503	5.0	0.1076	4.7	0.0157	2.3	362	50	100.7	2.3	100.7	2.3	72.2
TS-6	49	422	0.0524	6.1	0.1014	2.2	0.0158	2.7	37	23	101.5	2.5	101.5	2.5	79.2
TS-6	90	792	0.0686	9.8	0.1025	1.3	0.0159	1.8	19	13	104.6	2.3	104.6	2.3	89.0
TS-6	106	404	0.0483	10.4	0.1057	3.0	0.0165	3.6	21	22	105.7	2.9	105.7	2.9	76.2
TS-6	44	19	0.0850	37.6	0.1860	37.6	0.0182	11.5	1410	190	116	14	116	14	91.8
TS-6	28	1017	0.0750	4.1	0.1366	2.6	0.0214	2.7	13.3	13	141.6	3.7	141.6	3.7	87.0
TS-6	73	3110	0.0522	5.7	0.1683	2.3	0.0262	2.8	51	36	167.2	4.2	167.2	4.2	61.7
TS-6	36	86	0.0530	10.8	0.1940	10.3	0.0269	3.2	802	82	171.2	5.4	171.2	5.4	78.7
TS-6	127	350000	0.0676	4.0	0.2141	2.9	0.0332	3.0	50	32	215.2	6.5	215.2	6.5	75.0
TS-6	102	1161	0.0670	3.7	0.3040	6.6	0.0447	4.0	142	55	288	11	288	11	65.0
TS-6	31	4121	0.0528	3.2	0.3860	2.5	0.0534	2.1	301	42	335	6.3	335	6.3	-8.1
TS-6	89	3300	0.0592	5.7	0.4290	5.6	0.0601	4.3	279	53	380	16	380	16	37.8
TS-6	37	2203	0.0588	22.1	0.4650	3.0	0.0646	1.9	279	54	406.9	14	406.9	14	31.0
TS-6	34	350000	0.0542	4.2	0.4830	2.9	0.0665	2.3	295	53	415.9	8.5	415.9	8.5	-21.6
TS-6	109	1996	0.0563	4.1	0.4710	3.0	0.0676	2.2	227	60	424.5	8.8	424.5	8.8	7.7
TS-6	61	5033	0.0644	4.0	0.7120	7.3	0.0771	5.2	759	75	478	24	478	24	37.0
TS-6	54	5990	0.0706	3.3	1.4900	2.6	0.1550	2.0	957	48	929.3	17	957	48	3.0
TS-6	26	505	0.0699	7.2	1.6600	6.6	0.1730	3.1	979	92	1028	29	979	92	-5.0
TS-6	15	3549	0.0715	3.1	1.6530	2.7	0.1674	2.0	980	33	997.7	19	980	33	-1.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-6	82	1343	0.0708	4.4	1.6940	4.0	0.1734	2.4	987	54	1033	24	987	54	-4.7
TS-6	35	350000	0.0729	3.4	1.7410	2.8	0.1740	2.2	1012	49	1031.3	19	1012	49	-1.9
TS-6	111	8428	0.0785	3.1	1.4900	6.0	0.1472	4.2	1025	92	889	34	1025	92	23.5
TS-6	115	7033	0.1022	2.9	1.6690	6.0	0.1644	2.6	1029	100	1012	22	1029	100	39.1
TS-6	63	9090	0.0751	4.4	1.7770	3.5	0.1788	2.6	1037	71	1064	24	1037	71	3.1
TS-6	18	23200	0.0743	3.4	1.8790	3.2	0.1846	2.3	1044	40	1092	23	1044	40	-4.6
TS-6	74	3773	0.0743	3.8	1.8470	3.4	0.1810	2.1	1049	46	1072	21	1049	46	-2.2
TS-6	99	1070	0.0753	6.0	1.8400	5.3	0.1771	2.5	1057	63	1051	24	1057	63	0.6
TS-6	81	138700	0.0749	2.9	1.8470	2.3	0.1796	1.9	1063	39	1065.6	19	1063	39	-0.2
TS-6	85	4194	0.0756	3.0	1.9050	2.5	0.1830	2.0	1075	38	1082.7	20	1075	38	-0.1
TS-6	107	4971	0.0767	3.3	1.8690	2.7	0.1784	2.1	1101	48	1057.8	19	1101	48	4.6
TS-6	58	8040	0.0777	3.2	2.0330	2.9	0.1892	2.1	1131	52	1118.9	21	1131	52	1.1
TS-6	6	1490	0.0776	4.9	2.0000	5.0	0.1875	3.3	1146	59	1109	33	1146	59	3.2
TS-6	57	1305	0.0808	4.8	2.2700	4.1	0.2128	2.7	1156	59	1247	27	1156	59	0.7
TS-6	101	3452	0.0785	3.6	2.1490	3.0	0.2014	2.1	1157	50	1184	22	1157	50	-0.9
TS-6	108	2888	0.0799	3.9	2.3170	4.7	0.2100	2.6	1197	72	1227	25	1197	72	-1.8
TS-6	45	5050	0.1035	3.0	2.1900	7.3	0.2004	3.9	1203	120	1205	38	1203	120	28.6
TS-6	30	350000	0.0869	3.9	2.2900	6.6	0.2101	3.9	1207	79	1237	42	1207	79	9.8
TS-6	126	350000	0.0801	3.1	2.3720	2.7	0.2143	2.0	1210	46	1252	22	1210	46	-4.0
TS-6	72	18500	0.0806	3.1	2.4340	2.5	0.2165	1.9	1218	36	1263.1	22	1218	36	-3.7
TS-6	55	1809	0.0834	3.2	2.2040	3.1	0.1964	2.2	1269	58	1161	22	1269	58	9.4
TS-6	52	1178	0.0820	3.9	2.4030	3.8	0.2116	2.4	1277	61	1238	26	1277	61	2.9
TS-6	125	2187	0.0874	3.5	2.6470	3.0	0.2216	2.5	1351	37	1290	29	1351	37	4.5
TS-6	68	3376	0.0889	3.6	2.8610	3.1	0.2401	2.3	1373	54	1391	27	1373	54	2.0
TS-6	59	33900	0.0886	3.2	2.9440	2.8	0.2421	2.0	1403	35	1397	25	1403	35	0.4
TS-6	118	8475	0.0912	3.2	3.0590	3.3	0.2454	2.2	1447	60	1416	25	1447	60	3.1
TS-6	92	19250	0.0933	3.0	3.3110	2.7	0.2586	2.1	1491	39	1482	28	1491	39	0.6
TS-6	23	3483	0.0945	3.3	3.2300	3.7	0.2550	2.3	1493	56	1464	29	1493	56	3.9
TS-6	13	5968	0.0998	3.2	3.7530	3.2	0.2740	2.2	1603	51	1565	28	1603	51	3.5
TS-6	60	28650	0.0995	3.2	3.8330	2.9	0.2761	2.0	1620	37	1571	28	1620	37	3.0
TS-6	4	2306	0.1001	3.6	4.0700	3.7	0.2930	2.4	1623	63	1658	31	1623	63	-2.0
TS-6	69	16100	0.0997	3.1	3.8940	2.6	0.2830	1.9	1627	31	1608	28	1627	31	1.2
TS-6	95	6060	0.1004	3.0	3.9010	3.3	0.2826	2.1	1630	53	1606	29	1630	53	1.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-6	38	14445	0.1003	3.2	3.8230	2.9	0.2772	2.2	1632	33	1577	30	1632	33	3.4
TS-6	53	6278	0.1021	2.9	4.2270	2.6	0.3024	2.0	1658	33	1703	30	1658	33	-2.7
TS-6	117	2852	0.1038	3.8	4.1000	4.1	0.2902	2.4	1659	70	1645	31	1659	70	2.2
TS-6	9	12429	0.1016	3.0	4.2200	2.6	0.3013	2.0	1659	26	1699	29	1659	26	-2.4
TS-6	19	8467	0.1018	2.8	4.0770	2.5	0.2906	2.0	1660	36	1644	29	1660	36	1.0
TS-6	91	28200	0.1028	3.0	4.2380	2.6	0.3008	2.0	1667	28	1695	29	1667	28	-1.7
TS-6	75	5200	0.1028	2.9	4.1820	2.6	0.2948	2.0	1669	32	1665	29	1669	32	0.2
TS-6	113	38100	0.1021	3.1	4.2690	3.0	0.2990	2.1	1674	54	1682	30	1674	54	-0.9
TS-6	71	10810	0.1022	3.3	4.0210	3.7	0.2871	2.2	1677	60	1627	31	1677	60	2.9
TS-6	97	28033	0.1023	2.9	4.0630	3.0	0.2830	2.3	1680	49	1606	33	1680	49	3.9
TS-6	7	19967	0.1038	3.0	4.3070	2.8	0.3017	2.1	1685	46	1699	30	1685	46	-0.6
TS-6	65	5763	0.1034	3.1	4.3880	3.2	0.3035	2.1	1687	45	1707	30	1687	45	-1.4
TS-6	22	10594	0.1038	2.9	4.1640	2.6	0.2923	2.1	1690.7	32	1654	29	1690.7	32	2.0
TS-6	98	25167	0.1038	3.0	4.4240	2.7	0.3083	2.0	1692	28	1732	31	1692	28	-2.4
TS-6	123	42100	0.1044	3.1	4.2150	2.6	0.2926	2.2	1696	53	1655	31	1696	53	2.9
TS-6	76	10691	0.1039	2.9	4.3350	2.5	0.3017	1.9	1696.6	33	1700.3	29	1696.6	33	-0.3
TS-6	25	37500	0.1049	3.0	4.4490	2.5	0.3083	2.0	1718	40	1731.6	29	1718	40	-0.4
TS-6	93	12500	0.1065	2.8	4.5260	2.4	0.3083	2.0	1739.1	31	1732.6	29	1739.1	31	0.5
TS-6	77	8692	0.1071	3.0	4.5780	2.6	0.3103	2.1	1748	45	1744	30	1748	45	0.2
TS-6	94	350000	0.1118	3.0	4.9760	2.6	0.3240	2.0	1825	32	1811	30	1825	32	1.0
TS-6	62	1112	0.1131	3.6	5.0200	3.2	0.3239	2.3	1843	33	1810	36	1843	33	1.8
TS-6	119	2002	0.1129	3.1	5.3230	2.6	0.3409	2.1	1847	32	1893	34	1847	32	-2.5
TS-6	66	350000	0.1159	3.0	5.2700	3.0	0.3293	2.2	1897	46	1837	32	1897	46	3.5
TS-6	46	4795	0.1175	3.0	5.5060	2.7	0.3379	2.1	1924	38	1878	34	1924	38	2.2
TS-6	5	4024	0.1173	3.3	5.6700	4.8	0.3474	2.5	1935	67	1926	37	1935	67	-0.6
TS-6	10	13625	0.1293	2.9	7.0190	2.6	0.3973	2.0	2086	28	2156	37	2086	28	-3.4
TS-6	43	12817	0.1312	2.8	7.1140	2.4	0.3921	1.9	2115.6	32	2131.3	34	2115.6	32	-0.8
TS-6	39	350000	0.1454	3.1	8.4000	3.3	0.4236	2.2	2283	42	2277	40	2283	42	0.9
TS-6	110	4250	0.2116	3.0	16.9200	2.7	0.5821	2.1	2913	39	2951	49	2913	39	-1.1
TS-7	61	350000	0.0478	6.1	0.0909	2.8	0.0141	2.2	36	25	90.76	1.8	90.76	1.8	63.1
TS-7	111	749	0.0511	10.2	0.0917	25.1	0.0143	11.2	66	44	92	10	92	10	73.6
TS-7	106	778	0.0489	7.8	0.0934	3.6	0.0147	3.1	11.8	11	94.4	2.5	94.4	2.5	72.2
TS-7	38	541	0.0967	4.6	0.2431	7.0	0.0381	2.1	9.2	27	257.6	5.2	257.6	5.2	83.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-7	46	492	0.1016	4.8	0.3720	19.9	0.0507	8.7	346	99	337.5	30	337.5	30	79.5
TS-7	84	173	0.1557	5.2	0.3116	16.7	0.0475	2.9	82	73	343.4	8.3	343.4	8.3	85.7
TS-7	14	11025	0.0580	6.6	0.4270	22.5	0.0584	12.2	408	82	367	41	367	41	33.0
TS-7	88	3075	0.0583	6.7	0.4450	10.6	0.0617	6.5	294	77	389	25	389	25	27.6
TS-7	83	1428	0.0565	9.9	0.4550	7.7	0.0629	3.7	296	57	394.6	13	394.6	13	22.0
TS-7	97	795	0.0570	5.6	0.5060	7.9	0.0660	2.4	486	85	411.9	9.4	411.9	9.4	15.2
TS-7	114	1917	0.0552	5.6	0.5150	7.6	0.0662	2.0	458	57	413.2	7.9	413.2	7.9	9.8
TS-7	68	5532	0.0554	6.5	0.5080	2.8	0.0671	1.6	368	55	419.6	7.9	419.6	7.9	0.3
TS-7	35	38300	0.0560	4.8	0.5495	4.7	0.0717	2.0	442	52	447	8.2	447	8.2	-0.4
TS-7	15	2493	0.0636	7.4	0.6800	36.8	0.0778	18.0	795	73	483	75	483	75	39.2
TS-7	4	2412	0.0925	4.5	0.6067	6.1	0.0770	1.8	498.8	18	498.8	8.4	498.8	8.4	66.3
TS-7	103	2623	0.0664	6.3	0.7870	4.7	0.0975	2.2	526	78	608.8	12	526	78	20.4
TS-7	49	1124	0.1057	4.5	0.6580	8.7	0.0816	3.1	537	80	537	15	537	80	69.0
TS-7	26	1907	0.1013	4.5	0.9700	43.3	0.1070	26.2	680	510	679	130	680	510	58.8
TS-7	43	2811	0.1066	4.5	0.9280	9.2	0.1073	2.2	695	53	695	14	695	53	60.2
TS-7	66	1846	0.1020	4.4	0.9780	7.3	0.1118	3.5	715	89	715	24	715	89	56.8
TS-7	33	7425	0.0973	4.5	1.0570	10.4	0.1169	5.6	740	170	744	39	740	170	52.8
TS-7	95	818	0.1129	5.1	1.3400	14.9	0.1390	7.1	873	130	881	56	873	130	52.2
TS-7	58	16337	0.0963	4.6	1.3670	9.5	0.1449	2.5	894	130	898	20	894	130	42.1
TS-7	29	3858	0.0999	4.5	1.3710	9.5	0.1439	2.2	898	84	898	18	898	84	44.4
TS-7	40	2653	0.1074	4.6	1.3740	13.1	0.1440	3.8	909	110	909	29	909	110	48.3
TS-7	108	28350	0.0719	4.7	1.6760	7.8	0.1689	1.8	972	58	1004.6	18	972	58	-2.0
TS-7	62	3600	0.0747	4.8	1.8920	6.9	0.1823	2.1	1066	49	1079	21	1066	49	-1.2
TS-7	86	3354	0.0750	4.9	1.7830	6.7	0.1782	1.9	1071	62	1056.8	18	1071	62	1.3
TS-7	18	3264	0.0747	4.7	1.8210	7.1	0.1789	1.8	1073	69	1060.5	18	1073	69	0.1
TS-7	54	2378	0.0775	4.8	1.9590	6.6	0.1831	2.1	1130	60	1085	19	1130	60	4.8
TS-7	32	1049	0.0780	5.3	2.1680	7.4	0.1972	2.0	1172	48	1160	22	1172	48	1.0
TS-7	17	8780	0.0892	4.7	2.2500	12.9	0.1920	7.8	1172	250	1131	82	1172	250	20.3
TS-7	6	6827	0.0830	4.7	2.3590	5.9	0.2100	1.8	1266	62	1229.9	20	1266	62	3.6
TS-7	50	6062	0.0893	4.6	3.0130	7.0	0.2432	1.8	1411.2	45	1403.1	22	1411.2	45	0.6
TS-7	55	49850	0.0894	4.7	3.0070	7.3	0.2435	1.9	1416	54	1404.2	23	1416	54	1.0
TS-7	53	6350	0.0902	4.7	3.0960	6.8	0.2473	1.9	1437	57	1424	24	1437	57	0.9
TS-7	30	972	0.0907	5.0	3.0440	7.2	0.2388	2.0	1453	51	1380	25	1453	51	5.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-7	81	1024	0.0921	6.7	2.9600	8.8	0.2401	2.2	1456	91	1387	28	1456	91	4.7
TS-7	19	6367	0.0996	4.7	3.8880	6.9	0.2825	1.8	1620	45	1604	26	1620	45	1.0
TS-7	93	16025	0.1001	4.5	3.0480	6.9	0.2255	2.0	1628.4	56	1311	23	1628.4	56	19.5
TS-7	39	5182	0.1019	4.6	4.1110	7.5	0.2988	1.8	1642	77	1686	27	1642	77	-1.6
TS-7	100	13060	0.1012	4.6	3.9920	7.0	0.2901	2.0	1642	49	1642	29	1642	49	0.0
TS-7	115	49720	0.1026	4.7	4.2430	7.5	0.3038	1.8	1644	82	1711	27	1644	82	-2.2
TS-7	118	22700	0.1018	4.7	4.1800	7.2	0.2977	2.8	1647	55	1678	42	1647	55	-1.9
TS-7	117	1319	0.1019	5.1	4.1100	7.1	0.2933	2.4	1653	50	1657	35	1653	50	-0.2
TS-7	82	14900	0.1019	4.5	4.0940	6.8	0.2924	1.8	1657.9	51	1653.2	26	1657.9	51	0.2
TS-7	70	2374	0.1015	4.6	4.1560	7.9	0.2971	1.9	1659	67	1677	27	1659	67	-1.1
TS-7	59	1303	0.1023	4.7	4.1890	6.9	0.2959	1.9	1660	54	1673	28	1660	54	-0.8
TS-7	89	3181	0.1015	4.6	4.1260	7.0	0.3015	1.8	1661	55	1699	27	1661	55	-2.3
TS-7	113	1715	0.1016	4.6	4.1850	6.7	0.2950	2.3	1663	43	1666	34	1663	43	-0.2
TS-7	47	724	0.1015	4.9	4.3000	7.2	0.3080	2.0	1665	54	1730	30	1665	54	-3.9
TS-7	28	14563	0.1017	4.5	4.1180	7.5	0.2923	2.4	1665	79	1656	35	1665	79	0.4
TS-7	1	12200	0.1025	4.6	4.1560	7.0	0.2987	1.9	1667	58	1684	28	1667	58	-0.6
TS-7	56	10900	0.1024	4.6	4.1690	6.7	0.2937	1.8	1668	56	1660	27	1668	56	0.5
TS-7	42	6211	0.1021	4.7	4.2680	7.0	0.2993	1.8	1670	43	1688	27	1670	43	-1.1
TS-7	78	34067	0.1032	4.6	4.2250	7.1	0.2946	2.3	1673	110	1664	34	1673	110	0.5
TS-7	22	16521	0.1025	4.5	4.0890	6.8	0.2866	2.0	1673.5	50	1624	29	1673.5	50	3.0
TS-7	63	350000	0.1017	4.7	4.0350	9.2	0.2854	2.5	1675	92	1618	34	1675	92	2.8
TS-7	99	4686	0.1030	4.8	4.2970	7.0	0.3056	1.9	1677	47	1719	28	1677	47	-2.5
TS-7	45	11490	0.1029	4.6	4.1980	6.9	0.2958	1.9	1678	63	1670	28	1678	63	0.5
TS-7	87	6430	0.1040	4.7	4.4300	7.0	0.3066	2.0	1680	62	1721	29	1680	62	-1.3
TS-7	73	13180	0.1033	4.5	4.1230	7.0	0.2945	2.1	1681	54	1663	32	1681	54	1.1
TS-7	13	3367	0.1036	4.6	4.1200	6.8	0.2906	1.8	1683	54	1644.4	26	1683	54	2.3
TS-7	79	1610	0.1043	4.8	4.1580	7.2	0.2950	1.9	1691	67	1659	27	1691	67	2.0
TS-7	51	4692	0.1028	4.7	4.3300	6.9	0.3016	1.8	1693	48	1699	28	1693	48	-0.4
TS-7	110	2375	0.1024	4.6	4.0680	8.8	0.2861	2.0	1697	75	1623	28	1697	75	2.8
TS-7	3	2109	0.1081	4.9	4.4500	7.0	0.3106	2.1	1703	76	1737	28	1703	76	1.5
TS-7	2	6924	0.1041	4.7	4.0770	15.2	0.2889	5.9	1709	91	1633	62	1709	91	4.1
TS-7	76	4567	0.1056	4.5	4.2860	7.2	0.3021	1.8	1720.2	54	1701.2	27	1720.2	54	1.0
TS-7	44	6404	0.1061	4.5	4.2860	7.9	0.2909	1.9	1728	56	1645.7	26	1728	56	5.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-7	96	26740	0.1059	4.5	4.3620	7.3	0.3027	2.0	1729	55	1705	30	1729	55	1.2
TS-7	21	11808	0.1058	4.5	4.6150	7.2	0.3148	1.7	1731.8	50	1763.3	27	1731.8	50	-2.2
TS-7	80	1586	0.1092	4.6	4.4660	6.7	0.3043	1.8	1784	49	1712	28	1784	49	4.0
TS-7	36	1537	0.1087	4.7	4.7950	7.1	0.3170	2.0	1788	66	1774	29	1788	66	0.3
TS-8	97	2595	0.0472	6.6	0.0915	6.8	0.0142	3.7	322	65	90.9	3.3	90.9	3.3	71.8
TS-8	51	387	0.0497	6.0	0.1011	6.5	0.0149	3.8	359	58	95.2	3.6	95.2	3.6	73.5
TS-8	118	3800	0.0509	7.5	0.0969	2.5	0.0151	4.2	36	19	97	3.7	97	3.7	77.1
TS-8	87	1807	0.0496	7.1	0.1052	7.3	0.0153	3.7	410	63	97.6	3.6	97.6	3.6	76.2
TS-8	37	679	0.0507	6.5	0.1052	2.9	0.0163	4.2	22	15	104	4	104	4	72.3
TS-8	92	300	0.0519	7.1	0.1649	7.3	0.0230	3.9	426	68	146.2	5.7	146.2	5.7	65.7
TS-8	56	720	0.0485	5.6	0.1498	2.5	0.0232	3.8	56	27	147.2	5.3	147.2	5.3	53.1
TS-8	36	897	0.0955	3.4	0.3380	5.6	0.0469	4.7	311.9	23	311.9	13	311.9	13	79.7
TS-8	86	9110	0.0537	5.2	0.3900	5.9	0.0526	3.6	429	61	330.5	12	330.5	12	23.0
TS-8	99	6400	0.0540	4.3	0.4620	5.0	0.0622	3.5	389	50	389	13	389	13	0.0
TS-8	72	315	0.0611	6.7	0.5340	7.5	0.0632	4.1	693	86	394.7	16	394.7	16	43.0
TS-8	18	16900	0.0563	3.9	0.4890	4.7	0.0635	3.5	450	47	396.7	13	396.7	13	11.8
TS-8	21	1115	0.1057	3.6	0.6180	5.5	0.0776	3.7	506	100	512	19	506	100	70.4
TS-8	22	2611	0.1089	3.2	0.6110	8.5	0.0766	5.9	507	130	507	28	507	130	71.4
TS-8	25	5917	0.1037	3.3	1.1370	6.5	0.1255	3.8	797.1	32	797.1	27	797.1	32	52.9
TS-8	77	3624	0.1041	3.3	1.1610	6.0	0.1275	4.5	808	120	809	35	808	120	52.5
TS-8	63	759	0.0739	3.8	1.3500	8.9	0.1423	7.0	875	150	861	56	875	150	18.3
TS-8	40	1352	0.1115	3.4	1.3540	8.1	0.1410	5.7	893	110	896	46	893	110	50.8
TS-8	7	3368	0.1031	3.4	1.4090	6.5	0.1477	4.3	919	100	919	36	919	100	45.4
TS-8	20	2988	0.0762	3.4	1.7880	3.7	0.1732	3.6	1065	39	1032.4	33	1065	39	4.3
TS-8	114	3388	0.0763	4.6	1.8310	4.9	0.1824	3.8	1071	76	1079	36	1071	76	3.5
TS-8	23	24675	0.0753	3.5	1.8690	4.5	0.1819	3.4	1087	37	1077.4	34	1087	37	0.9
TS-8	71	1668	0.0751	3.9	1.8020	4.8	0.1738	3.6	1092	49	1033	34	1092	49	5.4
TS-8	11	21990	0.0787	3.8	2.0240	4.7	0.1903	3.7	1132	63	1127	37	1132	63	4.9
TS-8	81	1445	0.0791	3.9	2.1310	4.7	0.1947	3.5	1177	38	1147	37	1177	38	2.5
TS-8	35	7160	0.0881	3.6	2.9040	4.5	0.2388	3.4	1391	34	1380	43	1391	34	0.8
TS-8	19	10862	0.0916	3.5	3.0460	4.6	0.2437	3.4	1448	33	1405.7	44	1448	33	2.9
TS-8	1	52900	0.0908	3.3	3.0240	4.3	0.2400	3.5	1449	44	1386.9	42	1449	44	4.3
TS-8	117	1188	0.1038	4.6	3.3900	28.3	0.2630	14.4	1570	120	1520	120	1570	120	9.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-8	108	2775	0.1028	4.3	3.9300	7.4	0.2924	4.4	1591	93	1668	53	1591	93	-0.1
TS-8	106	3169	0.1013	3.6	4.0480	4.4	0.2920	3.4	1650	36	1651	50	1650	36	-0.1
TS-8	83	5019	0.1012	3.4	4.0570	4.4	0.2879	3.4	1660	39	1631	49	1660	39	1.7
TS-8	105	2165	0.1025	3.6	4.2200	5.5	0.2979	3.7	1661	50	1679	51	1661	50	-0.3
TS-8	14	2858	0.1021	4.2	4.0400	5.0	0.2928	3.8	1662	47	1655	54	1662	47	0.4
TS-8	39	2696	0.1017	3.5	4.0630	5.2	0.2922	3.8	1669	53	1651	51	1669	53	1.0
TS-8	66	3328	0.1027	3.7	4.0870	4.9	0.2896	3.8	1672	39	1639	54	1672	39	2.0
TS-8	74	3148	0.1041	3.7	4.0900	5.6	0.2921	3.8	1673	76	1661	51	1673	76	1.2
TS-8	73	4018	0.1030	3.3	4.0810	4.4	0.2865	3.4	1673	37	1624	49	1673	37	2.9
TS-8	115	4125	0.1025	3.6	4.0620	13.8	0.2867	8.4	1673	86	1627	83	1673	86	2.7
TS-8	100	3284	0.1028	3.4	4.3110	4.4	0.3035	3.3	1674	29	1709	51	1674	29	-2.1
TS-8	28	3304	0.1034	4.1	4.1700	4.8	0.2947	3.4	1674	43	1664	52	1674	43	0.6
TS-8	76	7031	0.1026	3.4	4.1960	4.5	0.2951	3.4	1675	38	1667	50	1675	38	0.5
TS-8	104	1421	0.1029	3.9	4.1360	4.8	0.2926	3.8	1677	42	1654	53	1677	42	1.4
TS-8	9	1593	0.1035	3.5	4.0610	4.9	0.2887	3.5	1677	49	1635	49	1677	49	2.7
TS-8	59	5057	0.1027	3.6	4.2030	4.8	0.2958	3.4	1677	36	1670	51	1677	36	0.4
TS-8	2	22660	0.1027	3.5	4.2170	5.0	0.2972	3.4	1678	50	1677	50	1678	50	-0.3
TS-8	61	3626	0.1029	3.5	4.2800	5.1	0.3013	3.7	1680	49	1699.8	51	1680	49	-1.5
TS-8	50	3771	0.1034	3.4	4.2390	4.5	0.2946	3.4	1680	36	1664	50	1680	36	1.0
TS-8	110	25058	0.1030	3.3	4.2280	4.5	0.2962	3.4	1681	41	1674	51	1681	41	0.6
TS-8	101	11178	0.1027	3.6	4.2130	9.7	0.2965	8.1	1682	36	1674	100	1682	36	0.5
TS-8	64	14525	0.1026	3.5	4.1980	5.2	0.2956	3.7	1683	43	1671	51	1683	43	0.2
TS-8	10	9853	0.1030	3.3	4.0400	4.2	0.2828	3.4	1683.9	32	1606	50	1683.9	32	4.6
TS-8	12	5324	0.1035	3.4	4.0700	4.9	0.2850	4.2	1684	34	1616	63	1684	34	4.0
TS-8	109	13450	0.1031	3.3	4.0710	7.9	0.2901	5.9	1687	340	1642	86	1687	340	2.7
TS-8	41	4908	0.1035	3.7	4.1650	4.6	0.2913	3.4	1689	39	1650	50	1689	39	2.3
TS-8	95	4759	0.1033	3.5	4.2630	4.5	0.2979	3.4	1690	30	1681	52	1690	30	0.5
TS-8	34	27950	0.1037	3.3	4.1470	4.3	0.2915	3.4	1692.3	35	1649	50	1692.3	35	2.6
TS-8	80	5610	0.1041	3.5	4.2120	4.5	0.2927	3.4	1694	32	1655	50	1694	32	2.3
TS-8	103	4307	0.1035	3.7	4.3100	4.6	0.3001	3.3	1696	41	1692	52	1696	41	0.2
TS-8	70	1158	0.1043	3.5	4.2100	5.5	0.2975	3.7	1697	58	1680	51	1697	58	1.2
TS-8	67	4741	0.1041	3.4	4.1680	4.1	0.2946	3.4	1697	38	1663	51	1697	38	2.5
TS-8	15	9892	0.1037	3.3	4.1480	5.5	0.2919	4.8	1698	43	1652.3	75	1698	43	2.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-8	69	5264	0.1037	3.4	4.2420	4.2	0.2954	3.4	1700	36	1670	51	1700	36	1.9
TS-8	88	9390	0.1039	3.5	4.2740	4.4	0.3005	3.3	1700	38	1694	51	1700	38	0.4
TS-8	29	350000	0.1047	3.3	4.1770	4.5	0.2938	3.4	1701	45	1660	50	1701	45	2.5
TS-8	46	5115	0.1044	3.4	4.2900	4.4	0.2962	3.4	1702	34	1672	50	1702	34	1.8
TS-8	5	4627	0.1036	3.5	4.3160	5.6	0.2996	3.7	1703	54	1689	51	1703	54	0.1
TS-8	94	64240	0.1044	3.4	4.2270	4.3	0.2957	3.4	1706	49	1668	49	1706	49	2.2
TS-8	33	4029	0.1058	3.6	4.3340	4.6	0.3007	3.7	1713	41	1695	52	1713	41	1.1
TS-8	112	13587	0.1049	3.3	4.4200	4.3	0.3092	3.6	1713	47	1737.6	52	1713	47	-1.5
TS-8	32	9542	0.1054	3.4	4.5300	5.1	0.3098	3.6	1717	49	1738	53	1717	49	-0.3
TS-8	113	32267	0.1064	3.4	4.3500	4.4	0.2995	3.3	1756	48	1689	51	1756	48	3.9
TS-8	38	1624	0.1081	3.4	4.6590	4.3	0.3131	3.5	1774	38	1756	53	1774	38	1.0
TS-8	79	3138	0.1074	3.8	4.4600	4.7	0.3078	3.6	1774	66	1734	54	1774	66	0.7
TS-8	43	5947	0.1082	3.4	4.8690	4.9	0.3261	3.4	1783	38	1818	54	1783	38	-2.6
TS-8	13	350000	0.1105	3.3	4.7000	4.3	0.3150	3.5	1812	42	1766	52	1812	42	2.3
TS-8	27	5261	0.1119	3.6	5.0410	4.6	0.3288	3.3	1840	40	1832	55	1840	40	0.4
TS-8	90	11227	0.1223	3.6	6.0300	4.6	0.3567	3.4	1974	31	1966	59	1974	31	0.4
TS-8	16	2049	0.1601	3.7	10.1000	6.2	0.4596	5.9	2453	34	2437	130	2453	34	0.7
TS-8	60	350000	0.1880	3.4	13.2900	4.8	0.5178	3.7	2723	45	2691	75	2723	45	1.5
TS-8	102	1756	0.2539	3.5	21.9400	5.0	0.6274	3.7	3236	49	3134	88	3236	49	2.4
TS-9	114	371	1.3542	0.2	0.0946	4.4	0.0141	1.9	90.4	1.7	90.4	1.7	90.4	1.7	0.0
TS-9	55	276	1.3011	0.2	0.0947	1.9	0.0146	2.4	75	28	93.9	1.8	93.9	1.8	0.0
TS-9	35	289	1.3333	0.2	0.0976	1.8	0.0150	2.1	27	14	96	1.9	96	1.9	0.0
TS-9	84	4200	1.5330	0.2	0.0998	5.9	0.0151	2.3	386	66	96.7	2.2	96.7	2.2	74.9
TS-9	98	1758	1.4153	0.2	0.1018	5.2	0.0153	2.2	97.7	2.1	97.7	2.1	97.7	2.1	0.0
TS-9	21	685	1.5863	0.3	0.1001	2.2	0.0155	2.7	24	11	100.3	2.5	100.3	2.5	79.9
TS-9	53	1543	0.9234	0.5	0.1550	4.6	0.0228	2.1	145.3	3	145.3	3	145.3	3	0.0
TS-9	76	3269	0.4382	0.3	0.2409	1.7	0.0357	1.7	152	28	226.5	3.5	226.5	3.5	7.9
TS-9	103	3620	0.4390	0.3	0.2493	1.6	0.0369	1.7	133	27	234	3.7	234	3.7	-7.8
TS-9	14	1028	0.3318	0.1	0.3223	2.5	0.0493	1.9	78	28	329	5.6	329	5.6	77.6
TS-9	42	42090	0.2467	0.4	0.4482	2.0	0.0597	1.5	394	21	374	5.3	374	5.3	5.1
TS-9	33	4140	0.2574	0.7	0.4590	2.6	0.0611	1.6	405	34	382.1	5.8	382.1	5.8	5.7
TS-9	31	2836	0.1126	0.8	1.7220	2.8	0.1692	2.1	1039	16	1046	19	1046	19	41.7
TS-9	101	2770	0.1564	1.7	1.7610	3.5	0.1709	2.9	1060	26	1060	28	1060	28	40.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-9	11	1104	0.0848	2.0	2.1150	2.4	0.1972	1.7	1148	34	1161	18	1161	18	0.5
TS-9	99	6705	0.0661	1.7	2.8570	1.2	0.2334	1.5	1389	8.6	1352.4	19	1352.4	19	2.6
TS-9	34	12264	0.0659	1.7	2.7810	1.4	0.2336	1.6	1346	18	1354.3	19	1354.3	19	-0.2
TS-9	115	14034	0.0638	1.1	2.8450	1.3	0.2340	1.5	1384	11	1356.9	18	1356.9	18	1.9
TS-9	88	10984	0.0808	1.4	2.8780	2.1	0.2360	1.9	1371	11	1366	24	1366	24	0.3
TS-9	97	1147	0.0689	2.8	2.8780	2.2	0.2380	1.6	1390	21	1376	20	1376	20	1.0
TS-9	13	9486	0.0910	0.9	2.9560	3.0	0.2390	2.3	1406	22	1381.5	27	1381.5	27	1.8
TS-9	118	5153	0.0598	1.3	2.9150	1.2	0.2416	1.5	1376	9.7	1396.8	18	1396.8	18	-1.9
TS-9	86	5726	0.0597	1.5	2.9510	1.4	0.2421	1.6	1389	15	1397.9	18	1397.9	18	-0.4
TS-9	90	26020	0.0597	1.3	2.8950	1.2	0.2422	1.4	1356.4	9.6	1398.3	18	1398.3	18	-3.1
TS-9	82	1726	0.0647	2.3	2.9480	2.0	0.2425	1.6	1412	27	1400	20	1400	20	0.1
TS-9	93	119200	0.0592	1.1	2.9660	1.2	0.2431	1.5	1387.2	7.6	1402.6	18	1402.6	18	-0.9
TS-9	43	2886	0.0625	1.8	2.9700	1.5	0.2434	1.5	1386	14	1404.2	19	1404.2	19	-1.3
TS-9	7	29040	0.0622	1.5	2.9400	1.5	0.2439	1.6	1371	13	1406.9	19	1406.9	19	-3.5
TS-9	65	6123	0.0604	1.3	2.9810	1.4	0.2444	1.6	1395	12	1408.6	19	1408.6	19	-1.1
TS-9	57	5992	0.0621	1.6	2.9670	1.6	0.2441	1.5	1378	13	1409	19	1409	19	-2.2
TS-9	41	9815	0.0603	1.6	2.9710	1.2	0.2445	1.5	1389	10	1409.5	19	1409.5	19	-1.8
TS-9	102	29480	0.0619	1.9	3.0110	1.5	0.2442	1.6	1437	21	1410.2	19	1410.2	19	0.1
TS-9	64	7277	0.0603	1.4	3.0050	1.4	0.2481	1.5	1376	13	1429	19	1429	19	-3.5
TS-9	62	24013	0.0738	1.1	3.0280	1.9	0.2497	1.9	1387	9.5	1436.5	24	1436.5	24	-3.9
TS-9	25	37125	0.0604	1.7	3.4250	1.6	0.2640	1.6	1510	16	1509	21	1509	21	0.1
TS-9	1	2769	0.0564	3.2	4.0030	1.7	0.2813	1.7	1676	16	1603	23	1603	23	4.9
TS-9	78	5520	0.0586	1.7	4.0340	1.7	0.2831	1.7	1694	13	1607	24	1607	24	5.3
TS-9	100	7311	0.0536	1.9	3.9720	1.5	0.2832	1.5	1655	12	1607.4	21	1607.4	21	2.9
TS-9	46	6340	0.0512	2.5	4.0530	1.3	0.2862	1.5	1701	12	1624	21	1624	21	4.2
TS-9	39	350000	0.0496	1.2	4.1030	1.1	0.2876	1.5	1686.5	7.7	1630.4	20	1630.4	20	3.1
TS-9	32	7380	0.0541	2.0	4.1420	1.5	0.2877	1.5	1703	16	1633	23	1633	23	3.1
TS-9	81	7736	0.0756	1.2	4.0980	2.2	0.2887	2.2	1691	12	1635.1	32	1635.1	32	3.5
TS-9	67	51725	0.0490	1.4	4.0300	1.1	0.2893	1.4	1649.7	7.7	1638	21	1638	21	0.7
TS-9	111	5091	0.0512	1.9	4.0430	1.3	0.2899	1.5	1654	8.9	1641	21	1641	21	0.7
TS-9	75	27315	0.0571	1.9	4.0600	1.9	0.2890	1.7	1667	17	1641	24	1641	24	1.0
TS-9	6	25430	0.0626	1.5	4.1880	2.3	0.2909	1.9	1702	14	1646	27	1646	27	3.3
TS-9	45	5720	0.0634	3.5	4.1610	2.3	0.2918	1.9	1697	22	1650	27	1650	27	2.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-9	91	18844	0.0505	1.7	4.0830	1.1	0.2921	1.5	1643	11	1650.2	21	1650.2	21	-0.2
TS-9	2	7168	0.0503	2.0	4.1960	1.2	0.2924	1.5	1692.9	9.5	1653.4	22	1653.4	22	2.3
TS-9	73	555	0.0664	5.0	4.1400	3.1	0.2930	1.9	1696	37	1656	28	1656	28	2.4
TS-9	87	17771	0.0628	1.3	4.1110	1.5	0.2932	1.8	1664	8.4	1657	27	1657	27	0.4
TS-9	54	5219	0.0533	3.2	4.1060	1.7	0.2937	1.6	1655	19	1660	23	1660	23	-0.3
TS-9	18	4760	0.0530	1.8	4.2140	1.2	0.2944	1.6	1701	11	1664	23	1664	23	2.4
TS-9	113	2489	0.0620	3.2	4.1100	2.9	0.2966	2.0	1637	35	1667	27	1667	27	-2.5
TS-9	12	13764	0.0516	1.9	4.2610	1.3	0.2952	1.5	1697.6	6.6	1667	23	1667	23	1.8
TS-9	77	6095	0.0534	2.1	4.2860	1.6	0.2963	1.6	1703	15	1674	23	1674	23	1.2
TS-9	121	1959	0.0511	2.3	4.2010	1.9	0.2961	1.8	1693	20	1675	22	1675	22	0.2
TS-9	3	6390	0.0534	1.7	4.2260	1.4	0.2966	1.6	1703	8.9	1675.4	23	1675.4	23	1.5
TS-9	96	6809	0.0487	1.8	4.2240	1.2	0.2971	1.5	1674.6	9.3	1677.3	21	1677.3	21	-0.2
TS-9	69	9870	0.0497	1.7	4.2020	1.3	0.2976	1.4	1669	10	1678.7	22	1678.7	22	-0.4
TS-9	27	2380	0.0519	2.9	4.2770	1.6	0.2973	1.6	1689	20	1679	23	1679	23	0.0
TS-9	116	16547	0.0508	2.2	4.1570	1.4	0.2976	1.5	1644	13	1679	22	1679	22	-2.1
TS-9	49	3944	0.0508	3.0	4.1960	1.8	0.2978	1.5	1657	22	1680	22	1680	22	-1.7
TS-9	50	4677	0.0481	1.5	4.2430	1.1	0.2989	1.4	1677.2	7.3	1686	21	1686	21	-0.4
TS-9	92	12200	0.0503	2.8	4.2470	1.4	0.2992	1.5	1664	13	1686	22	1686	22	-1.6
TS-9	38	12338	0.0492	1.8	4.2280	1.2	0.2985	1.5	1662	11	1687.1	22	1687.1	22	-1.2
TS-9	47	16920	0.0492	1.5	4.3580	1.2	0.2992	1.5	1719.6	7.1	1687.2	22	1687.2	22	1.9
TS-9	20	11414	0.0502	2.2	4.2520	1.5	0.2994	1.5	1680	12	1688.5	22	1688.5	22	-0.4
TS-9	68	20080	0.0508	2.2	4.3080	1.4	0.3008	1.6	1683	12	1695.9	23	1695.9	23	-0.2
TS-9	15	8611	0.0496	2.2	4.3070	1.3	0.3008	1.5	1688	17	1696.5	22	1696.5	22	-0.6
TS-9	10	14225	0.0495	1.3	4.3010	1.3	0.3014	1.5	1683.1	8.3	1698.4	22	1698.4	22	-1.2
TS-9	5	16491	0.0505	2.4	4.5220	1.4	0.3016	1.6	1758	8.3	1700	23	1700	23	3.2
TS-9	16	16310	0.0479	1.9	4.3270	1.3	0.3031	1.5	1696	13	1706.8	22	1706.8	22	-0.7
TS-9	94	4289	0.0490	2.0	4.2400	1.4	0.3032	1.5	1654	9.4	1707	22	1707	22	-3.2
TS-9	104	850	0.0543	3.5	4.2720	2.1	0.3038	1.7	1641	30	1708	25	1708	25	-2.7
TS-9	83	6600	0.0608	4.3	4.4300	3.8	0.3049	2.2	1692	51	1708	28	1708	28	-3.1
TS-9	63	12319	0.0487	1.5	4.4200	1.3	0.3040	1.5	1719.5	8.2	1711.6	22	1711.6	22	0.3
TS-9	80	10868	0.0507	3.0	4.3180	2.2	0.3051	1.7	1659	27	1713	23	1713	23	-4.8
TS-9	22	5014	0.0516	2.9	4.3350	1.6	0.3047	1.7	1674	14	1716	24	1716	24	-2.8
TS-9	72	11531	0.0483	1.8	4.3140	1.2	0.3052	1.5	1678.8	7.8	1717	22	1717	22	-2.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-9	48	3516	0.0489	2.0	4.3670	1.1	0.3066	1.5	1663	12	1724	23	1724	23	-3.5
TS-9	112	1451	0.0922	2.0	4.5410	4.2	0.3067	3.0	1742	42	1726	45	1726	45	1.1
TS-9	89	1810	0.0496	2.8	4.4850	1.8	0.3105	1.6	1708	19	1745	24	1745	24	-2.7
TS-9	74	13105	0.0492	2.4	4.5500	1.4	0.3129	1.5	1724	13	1751	23	1751	23	-1.6
TS-9	23	45520	0.0561	1.4	4.6450	1.7	0.3160	1.8	1741.1	7.1	1769.9	28	1769.9	28	-1.6
TS-9	95	14714	0.0424	2.3	5.4840	1.1	0.3439	1.5	1894	6.8	1904	24	1904	24	-0.3
TS-9	79	82100	0.0403	2.7	6.3130	1.3	0.3728	1.5	1993	9.1	2044	26	2044	26	-2.6
TS-9	44	2470	0.0327	7.3	13.4000	2.0	0.5236	1.8	2699	17	2717	38	2717	38	-0.4
TS-10	103	266	0.0472	5.1	0.0915	2.1	0.0141	2.1	72	30	90.5	1.9	90.5	1.9	70.4
TS-10	39	4257	0.0464	4.1	0.1017	1.5	0.0158	2.0	23	11	100.5	1.9	100.5	1.9	50.7
TS-10	62	8940	0.0480	4.2	0.1546	2.1	0.0236	2.3	62	25	150.3	3.3	150.3	3.3	33.8
TS-10	117	2962	0.0520	3.8	0.2185	3.8	0.0304	1.9	366	50	192.9	3.6	192.9	3.6	47.3
TS-10	118	8318	0.0538	3.2	0.3570	3.1	0.0477	1.7	365	44	300.6	4.9	300.6	4.9	17.6
TS-10	92	483	0.0573	4.2	0.3255	2.6	0.0483	2.3	179	50	307.7	6	307.7	6	41.6
TS-10	99	19870	0.0537	3.0	0.4116	1.8	0.0569	1.8	280	41	358	5.8	358	5.8	1.9
TS-10	26	6790	0.0555	1.4	0.4363	1.6	0.0583	1.6	414	19	365.9	5.5	365.9	5.5	16.1
TS-10	34	3910	0.0567	3.0	0.4610	2.2	0.0621	1.8	355	51	389	6.6	389	6.6	14.3
TS-10	113	16250	0.0576	2.3	0.5050	2.8	0.0644	2.3	518	25	402.4	9.1	402.4	9.1	22.3
TS-10	33	1291	0.0552	3.4	0.4680	2.4	0.0651	1.8	271	46	408	6.8	408	6.8	6.8
TS-10	106	3826	0.0541	3.1	0.4780	2.9	0.0663	2.0	261	48	412.7	6.9	412.7	6.9	-5.0
TS-10	112	289	0.0600	3.8	0.4920	4.5	0.0657	3.5	349	49	413	13	413	13	32.3
TS-10	2	4157	0.0553	2.5	0.4900	2.2	0.0663	1.7	394	34	414.1	6.3	414.1	6.3	-1.0
TS-10	60	6480	0.0554	2.2	0.5200	2.1	0.0681	1.6	414	26	424.7	6.5	424.7	6.5	-2.6
TS-10	83	13730	0.0561	3.2	0.4890	2.7	0.0677	1.9	299	45	425	7.3	425	7.3	8.4
TS-10	43	1930	0.0551	4.4	0.5340	4.1	0.0694	1.9	519	44	432.5	7.9	432.5	7.9	16.7
TS-10	16	1785	0.0566	2.5	0.5420	2.6	0.0715	1.8	444	44	445.9	7.7	445.9	7.7	5.9
TS-10	67	8130	0.0557	2.7	0.5650	2.7	0.0753	1.7	352	51	469.5	7.6	469.5	7.6	-5.0
TS-10	18	1862	0.0578	3.3	0.6170	1.8	0.0789	1.6	486	27	490.8	7.6	490.8	7.6	0.2
TS-10	81	2794	0.0595	2.4	0.6350	3.1	0.0797	2.8	541	26	495	13	495	13	16.8
TS-10	40	625	0.0588	3.6	0.7010	2.4	0.0888	2.0	528	46	548.4	9.5	528	46	2.2
TS-10	19	5150	0.0582	2.1	0.6920	2.0	0.0862	1.6	537	26	532.8	8.2	532.8	8.2	0.8
TS-10	101	3620	0.0592	2.9	0.7830	1.8	0.0976	1.7	561	38	601.1	9.6	561	38	-4.7
TS-10	68	713	0.0612	2.8	0.8210	1.8	0.0991	1.9	625	32	609.3	9.4	625	32	7.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-10	75	698	0.0606	2.1	0.8080	2.0	0.0983	1.7	626	27	604.7	9.3	626	27	3.7
TS-10	31	30800	0.0610	1.8	0.8600	1.7	0.1015	1.5	638	26	622.9	8.9	638	26	2.4
TS-10	15	2589	0.0700	1.2	1.4640	1.3	0.1535	1.5	926	13	920.3	13	926	13	0.6
TS-10	59	983	0.0732	2.6	1.6140	2.7	0.1628	1.8	992	44	974	16	992	44	2.6
TS-10	87	49910	0.0729	1.4	1.6920	1.3	0.1693	1.5	997	23	1009.4	14	997	23	-0.4
TS-10	49	2340	0.0721	1.7	1.6490	1.8	0.1645	1.7	1006	22	981.6	15	1006	22	2.4
TS-10	72	4124	0.0734	4.6	1.7930	4.5	0.1788	2.5	1018	57	1059	25	1018	57	-4.0
TS-10	86	12094	0.0736	0.7	1.7430	0.7	0.1721	1.4	1027.1	8.7	1023.8	13	1027.1	8.7	0.3
TS-10	78	919	0.0734	3.0	1.8100	2.8	0.1755	1.8	1040	32	1042	17	1040	32	-0.2
TS-10	5	7210	0.0745	2.7	1.8750	2.8	0.1813	1.8	1042	31	1074	18	1042	31	-3.1
TS-10	69	1787	0.0740	2.7	1.8080	2.3	0.1765	1.8	1048	42	1052	17	1048	42	0.5
TS-10	45	902	0.0749	1.9	1.7360	1.9	0.1700	1.6	1063	26	1012.1	15	1063	26	5.2
TS-10	4	927	0.0777	4.2	1.7630	4.3	0.1759	2.5	1064	69	1052	20	1064	69	8.4
TS-10	38	2365	0.0745	1.2	1.7880	1.6	0.1736	1.7	1066	16	1031.8	16	1066	16	2.7
TS-10	120	356	0.0767	3.7	2.0990	3.7	0.1964	2.6	1099	51	1154	24	1099	51	-4.1
TS-10	97	1108	0.0777	1.9	1.9830	2.0	0.1858	1.7	1139	36	1098.1	16	1139	36	2.8
TS-10	119	2185	0.0784	2.3	2.0780	2.0	0.1929	1.8	1146	32	1142.1	17	1146	32	1.5
TS-10	11	1950	0.0806	2.9	2.1390	3.4	0.2000	1.9	1154	51	1186	18	1154	51	3.5
TS-10	96	3107	0.0774	1.8	2.1140	1.5	0.1956	1.6	1156	27	1150.5	17	1156	27	-1.1
TS-10	110	3893	0.0786	1.8	2.2340	1.6	0.2040	1.6	1160	27	1196.6	17	1160	27	-2.8
TS-10	108	1757	0.0801	1.6	2.2590	1.6	0.2047	1.6	1199	27	1197.1	17	1199	27	1.1
TS-10	44	4700	0.0858	2.1	2.5090	2.3	0.2145	1.9	1316	23	1253	21	1316	23	4.8
TS-10	57	2963	0.0846	2.5	2.6350	2.2	0.2277	1.8	1321	29	1322	21	1321	29	-0.1
TS-10	21	1630	0.0867	2.8	2.7710	2.6	0.2313	1.7	1363	34	1341	21	1363	34	1.6
TS-10	82	5063	0.0873	3.1	2.9440	3.0	0.2393	1.8	1363	33	1383	23	1363	33	-1.5
TS-10	77	3476	0.0884	1.9	2.8670	2.1	0.2376	1.8	1370	33	1375	21	1370	33	1.1
TS-10	37	7486	0.0889	1.5	2.9420	1.8	0.2393	1.7	1395	17	1383	21	1395	17	0.9
TS-10	84	19343	0.0901	1.2	2.7950	1.8	0.2291	1.7	1397	19	1332.2	19	1397	19	6.3
TS-10	61	7810	0.0913	2.2	3.2120	2.1	0.2545	1.8	1428	37	1464	23	1428	37	-0.3
TS-10	93	659	0.0888	2.7	3.1350	2.7	0.2542	2.1	1445	28	1459	28	1445	28	-1.0
TS-10	42	1413	0.0918	1.5	3.2590	1.7	0.2547	1.6	1467	16	1463	21	1467	16	0.3
TS-10	52	1579	0.0942	1.6	3.4990	1.6	0.2677	1.7	1499	20	1534	22	1499	20	-0.9
TS-10	74	3361	0.0941	1.6	3.4490	1.8	0.2646	1.7	1510	20	1512	21	1510	20	-0.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-10	41	6199	0.0941	1.5	3.3570	1.3	0.2587	1.5	1511	19	1483	21	1511	19	1.9
TS-10	14	3253	0.0939	1.3	3.4410	1.4	0.2655	1.5	1521	16	1517.9	20	1521	16	0.2
TS-10	105	3355	0.0976	1.1	3.7350	1.2	0.2774	1.4	1574	12	1578.3	20	1574	12	-0.3
TS-10	51	28575	0.1002	1.3	3.9530	1.7	0.2859	1.6	1618	18	1622	23	1618	18	0.1
TS-10	91	17800	0.1001	1.6	4.1630	1.6	0.2978	1.8	1624	15	1680	27	1624	15	-3.4
TS-10	25	13411	0.1010	1.1	3.7950	1.0	0.2742	1.6	1631	12	1565.4	20	1631	12	4.2
TS-10	80	4186	0.1008	1.6	4.0090	1.9	0.2874	1.7	1644	17	1630	24	1644	17	0.9
TS-10	9	2439	0.1019	1.4	4.0560	1.2	0.2915	1.5	1650	16	1649.1	22	1650	16	0.1
TS-10	116	2126	0.1016	1.9	4.1570	1.8	0.2959	1.8	1659	23	1671	26	1659	23	-0.7
TS-10	90	1866	0.1015	1.8	4.0450	1.8	0.2887	1.8	1665	21	1635	25	1665	21	1.4
TS-10	98	1453	0.1019	2.1	4.0100	2.4	0.2856	2.0	1672	26	1619	29	1672	26	2.6
TS-10	50	7516	0.1028	0.9	4.0720	1.0	0.2857	1.6	1675	11	1620	22	1675	11	3.1
TS-10	53	1841	0.1053	2.2	3.9100	3.1	0.2791	2.3	1683	46	1593	29	1683	46	6.8
TS-10	35	3866	0.1030	1.1	4.1860	1.0	0.2928	1.5	1687	15	1655.6	21	1687	15	1.5
TS-10	48	3883	0.1028	2.2	4.3000	3.0	0.2971	1.9	1691	45	1675	26	1691	45	-0.2
TS-10	63	28320	0.1047	0.9	4.3510	0.9	0.3020	1.4	1701	11	1700.1	21	1701	11	0.2
TS-10	46	3539	0.1043	1.9	4.4460	2.2	0.3073	1.8	1728	28	1732	25	1728	28	-1.1
TS-10	36	1446	0.1053	1.5	4.2520	1.4	0.2923	1.6	1733	19	1653	23	1733	19	4.6
TS-10	1	1763	0.1068	1.6	4.4100	2.3	0.3048	2.2	1734	19	1714	33	1734	19	1.2
TS-10	79	12073	0.1072	0.9	4.8340	1.0	0.3264	1.5	1743	13	1820	24	1743	13	-4.4
TS-10	17	8978	0.1071	1.5	4.6460	1.5	0.3122	1.6	1758	15	1751	24	1758	15	0.4
TS-10	94	15380	0.1093	0.7	4.7410	0.8	0.3155	1.5	1784	8	1768	23	1784	8	0.9
TS-10	109	3938	0.1094	1.2	4.9520	1.3	0.3274	1.5	1791	15	1826	24	1791	15	-2.0
TS-10	88	9931	0.1109	1.4	5.1300	2.3	0.3348	1.7	1797	23	1856	29	1797	23	-2.1
TS-10	104	2993	0.1102	1.5	4.9960	1.6	0.3277	1.6	1805	19	1827	25	1805	19	-1.2
TS-10	6	4870	0.1110	1.9	5.1310	1.7	0.3337	1.9	1805	22	1855	30	1805	22	-1.9
TS-10	23	4417	0.1215	1.2	5.1200	3.1	0.3213	2.4	1887	30	1811	34	1887	30	8.9
TS-10	100	9830	0.1186	1.4	5.5780	1.3	0.3375	1.5	1947	12	1875	25	1947	12	3.7
TS-10	89	3036	0.1193	1.7	5.7690	1.6	0.3489	1.6	1964	16	1929	27	1964	16	1.8
TS-10	107	4233	0.1285	1.3	6.9540	1.2	0.3930	1.5	2074	19	2132	29	2074	19	-2.6
TS-10	10	2200	0.1854	1.4	13.5000	1.6	0.5228	1.7	2701	13	2711	38	2701	13	-0.4
TS-10	3	350000	0.1886	1.6	12.8600	2.9	0.4985	2.2	2728	36	2606	37	2728	36	4.9
TS-10	64	13080	0.1939	2.0	14.5700	2.3	0.5420	2.4	2785	24	2790	52	2785	24	-0.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-10	7	9320	0.1973	1.1	13.9000	1.1	0.5115	1.6	2806	12	2663	34	2806	12	5.1
TS-10	65	6786	0.2026	0.8	15.6900	0.9	0.5559	1.5	2852.6	7.8	2850	34	2852.6	7.8	0.1
TS-11	77	255	0.0504	6.3	0.0960	2.6	0.0149	3.0	17	10	95.6	2.5	95.6	2.5	77.5
TS-11	8	1559	0.0522	3.6	0.2940	3.7	0.0417	2.2	343	39	263.3	5.6	263.3	5.6	23.2
TS-11	71	87	0.2419	2.8	0.2300	3.3	0.0334	2.6	191	33	281	8.5	281	8.5	91.0
TS-11	36	214	0.1450	4.6	0.3180	5.0	0.0437	4.3	309.8	10	309.5	11	309.5	11	86.2
TS-11	82	1512	0.0653	8.0	0.3718	1.9	0.0518	1.4	278	40	330.7	6.5	330.7	6.5	56.6
TS-11	60	1071	0.0558	3.9	0.4090	4.2	0.0535	2.1	439	45	336	6.7	336	6.7	23.5
TS-11	106	212	0.1195	5.3	0.3391	1.7	0.0494	2.4	193	35	341.6	5.9	341.6	5.9	82.3
TS-11	5	3867	0.0542	2.8	0.4270	2.8	0.0568	1.8	399	37	356	6.4	356	6.4	10.8
TS-11	73	1924	0.0551	2.7	0.4850	3.1	0.0637	1.9	407	33	398.3	7.2	398.3	7.2	2.1
TS-11	43	1987	0.0571	98.1	0.5020	478.1	0.0658	38.0	460	390	411	130	411	130	10.7
TS-11	99	5243	0.0608	2.5	0.5072	1.9	0.0662	1.8	477	31	415.8	7.1	415.8	7.1	32.4
TS-11	101	12255	0.0546	2.6	0.5010	3.0	0.0669	1.8	391	29	417.3	7.4	417.3	7.4	-6.7
TS-11	54	3543	0.0587	1.9	0.5201	1.6	0.0675	1.8	488	25	421.9	7	421.9	7	24.0
TS-11	58	228	0.1434	2.4	0.4714	1.6	0.0616	1.8	432.2	6.9	432.2	9.4	432.2	9.4	81.0
TS-11	117	652	0.1106	1.6	0.5130	2.1	0.0666	2.1	445.6	7.3	445.6	9.1	445.6	9.1	75.2
TS-11	65	1847	0.0577	2.4	0.6550	2.9	0.0821	1.8	535	32	508.6	9	508.6	9	4.9
TS-11	47	176	0.1731	9.2	0.5980	5.5	0.0738	5.0	555	24	535	21	535	21	79.2
TS-11	91	2957	0.1043	1.2	1.5270	3.1	0.1553	2.3	967	20	967	19	967	20	43.1
TS-11	75	1815	0.1173	1.1	1.7070	13.5	0.1667	6.0	1045	100	1045	51	1045	100	45.5
TS-11	62	27740	0.0780	2.1	2.0000	2.4	0.1863	1.8	1137	24	1101.4	18	1137	24	3.1
TS-11	7	12536	0.0792	1.6	2.0670	1.7	0.1908	1.9	1173	22	1124.5	17	1173	22	4.5
TS-11	114	2266	0.0813	2.1	2.3880	2.5	0.2134	1.8	1226	23	1247	20	1226	23	-1.7
TS-11	116	3060	0.0836	2.6	2.5450	3.9	0.2240	2.1	1239	66	1306	24	1239	66	-3.6
TS-11	100	257	0.1601	1.7	2.6270	4.2	0.2238	2.1	1317	60	1420	31	1317	60	42.3
TS-11	103	13675	0.0883	3.2	2.7930	2.6	0.2289	1.8	1383	50	1330	22	1383	50	3.8
TS-11	67	2903	0.0899	1.4	2.9700	1.9	0.2408	1.7	1415	17	1390.9	21	1415	17	1.7
TS-11	28	7007	0.0899	1.3	2.9250	1.9	0.2374	1.7	1420	17	1372.7	21	1420	17	3.5
TS-11	107	6103	0.0898	1.1	2.9380	1.8	0.2377	1.7	1422.5	15	1375.9	21	1422.5	15	3.1
TS-11	108	23330	0.0911	2.3	3.2290	2.4	0.2566	1.9	1439	38	1475	24	1439	38	-2.7
TS-11	21	280	0.1549	2.3	3.5500	3.9	0.2624	2.5	1586	35	1602	29	1586	35	33.2
TS-11	86	303	0.1506	4.9	3.9000	2.2	0.2832	1.4	1621	40	1700	37	1621	40	27.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-11	111	857	0.1174	1.5	3.7600	4.0	0.2717	2.3	1627	26	1581	25	1627	26	17.4
TS-11	66	260	0.1617	3.2	4.0100	6.7	0.2937	3.7	1630	59	1775	46	1630	59	27.6
TS-11	92	422	0.1367	2.6	3.9510	2.2	0.2837	2.0	1638	29	1683	27	1638	29	23.2
TS-11	16	6660	0.1020	1.6	4.0870	2.7	0.2910	1.9	1656	23	1646	26	1656	23	1.0
TS-11	42	892	0.1143	1.0	3.9480	3.8	0.2820	2.0	1670	42	1624	26	1670	42	13.1
TS-11	51	3116	0.1028	1.5	4.2140	2.1	0.2961	1.8	1679	17	1670	26	1679	17	0.6
TS-11	104	6589	0.1026	1.5	4.1850	1.9	0.2946	1.7	1685	20	1664	25	1685	20	1.3
TS-11	46	1686	0.1043	1.9	4.2670	2.2	0.3002	1.8	1692	18	1692	27	1692	18	0.0
TS-11	50	26833	0.1038	1.2	4.3150	1.7	0.3006	1.6	1695.5	12	1694.1	25	1695.5	12	0.1
TS-11	35	56300	0.1044	1.3	4.3380	2.0	0.3011	1.8	1696	18	1696	25	1696	18	0.2
TS-11	97	22950	0.1042	1.4	4.2340	2.1	0.2938	1.8	1698	20	1659	26	1698	20	2.1
TS-11	102	11467	0.1031	1.8	4.3110	2.6	0.3004	2.1	1699	28	1690	28	1699	28	0.2
TS-11	79	12888	0.1040	1.3	4.4060	1.9	0.3050	1.7	1701	15	1716	26	1701	15	-0.9
TS-11	15	16200	0.1040	1.6	4.6000	2.8	0.3149	2.1	1701	23	1767	32	1701	23	-4.1
TS-11	70	1529	0.1044	1.4	4.2590	3.8	0.2962	3.7	1702	14	1672	56	1702	14	1.8
TS-11	24	102370	0.1051	1.3	4.2830	1.7	0.2968	1.8	1703	17	1677	24	1703	17	1.5
TS-11	81	2876	0.1048	1.4	4.4830	2.5	0.3095	2.0	1708	16	1740	29	1708	16	-1.2
TS-11	112	7920	0.1043	4.4	4.3130	3.2	0.2968	4.7	1709	61	1675	74	1709	61	2.0
TS-11	48	12462	0.1047	1.1	4.3160	1.7	0.2999	1.7	1709.8	13	1690.9	24	1709.8	13	1.0
TS-11	44	6150	0.1046	1.3	4.4160	2.1	0.3063	1.8	1710	15	1722.3	26	1710	15	-0.4
TS-11	76	19333	0.1045	1.2	4.2060	1.9	0.2938	1.8	1710	14	1661	26	1710	14	2.8
TS-11	72	2384	0.1059	1.6	4.2620	2.6	0.2952	1.9	1720	24	1672	26	1720	24	3.7
TS-11	78	2200	0.1058	1.5	4.4350	2.0	0.3036	1.7	1724	19	1709	26	1724	19	0.9
TS-11	41	5339	0.1061	2.0	4.3720	1.9	0.3028	1.9	1726	25	1706	26	1726	25	1.2
TS-11	37	6031	0.1058	1.3	4.1780	1.8	0.2897	1.8	1729	16	1642.8	25	1729	16	5.0
TS-11	14	1723	0.1064	1.6	4.3960	2.0	0.3008	1.8	1739	22	1700	26	1739	22	1.7
TS-11	20	7213	0.1075	1.6	4.3190	2.1	0.2934	1.8	1752	17	1660	26	1752	17	5.3
TS-11	118	119000	0.1074	1.1	4.5310	1.7	0.3049	1.7	1759	14	1715.7	25	1759	14	2.5
TS-11	22	19054	0.1073	1.3	4.5150	1.7	0.3051	1.7	1760.3	13	1716.3	25	1760.3	13	2.5
TS-11	61	1577	0.1108	8.1	4.3900	2.5	0.2992	3.3	1765	38	1697	27	1765	38	5.5
TS-11	115	7400	0.1097	1.2	4.5150	1.9	0.3022	1.8	1781	15	1702	26	1781	15	4.8
TS-11	40	161000	0.1090	1.1	4.7000	1.8	0.3116	1.7	1786.4	11	1749.4	26	1786.4	11	2.1
TS-11	63	2211	0.1122	1.6	4.6440	1.7	0.3083	1.8	1788	17	1741	26	1788	17	5.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-11	95	6385	0.1098	1.0	4.9020	2.4	0.3241	2.2	1796.1	15	1809	35	1796.1	15	-0.8
TS-11	94	3367	0.1106	1.3	4.7710	1.8	0.3147	1.7	1802	14	1761.2	26	1802	14	2.7
TS-11	55	1731	0.1120	1.3	4.7350	2.0	0.3119	1.9	1811	17	1751.2	25	1811	17	4.1
TS-11	3	9333	0.1109	1.2	4.8530	1.9	0.3200	1.8	1812	10	1790	28	1812	10	1.2
TS-11	88	4700	0.1169	1.5	5.4970	1.8	0.3418	1.7	1906	16	1895	28	1906	16	0.6
TS-11	96	3600	0.1165	2.0	5.4250	4.2	0.3340	3.3	1912	31	1858	53	1912	31	2.8
TS-11	113	37900	0.1263	1.3	6.3940	2.2	0.3714	1.9	2038	16	2036	31	2038	16	0.6
TS-11	59	16400	0.1526	1.0	8.9610	1.8	0.4265	1.7	2378.4	12	2290	33	2378.4	12	3.5
TS-12	60	3830	0.0467	0.6	0.0966	2.2	0.0151	3.2	27	13	97.3	2.8	97.3	2.8	-258.9
TS-12	77	350000	0.0481	1.5	0.1016	2.1	0.0156	2.8	96	34	100.3	2.6	100.3	2.6	-4.0
TS-12	26	76	0.0461	0.0	0.1437	3.3	0.0226	3.7	1.6	0.16	199.9	8.4	199.9	8.4	-8893.8
TS-12	6	615	0.0490	1.5	0.2680	2.8	0.0395	2.8	141	35	249.1	6.4	249.1	6.4	-76.9
TS-12	69	469	0.0517	0.2	0.2844	3.5	0.0399	2.8	273.6	4.5	273.6	7.2	273.6	7.2	7.9
TS-12	96	815	0.0548	0.3	0.4606	3.5	0.0609	2.6	405.3	5.8	405.3	10	405.3	10	6.0
TS-12	57	3241	0.0567	2.6	0.5190	4.2	0.0661	2.6	504	38	412.4	10	412.4	10	18.2
TS-12	54	708	0.0553	2.7	0.4860	4.7	0.0649	3.2	421	65	412.7	10	412.7	10	3.7
TS-12	8	3945	0.0542	2.6	0.4990	3.2	0.0682	3.2	373	58	430.3	12	430.3	12	-14.0
TS-12	16	145	0.0540	3.5	0.4340	7.6	0.0578	5.4	356	83	435	23	435	23	-1.7
TS-12	21	2057	0.0541	1.8	0.5390	3.5	0.0711	2.8	365	45	444.7	11	444.7	11	-21.4
TS-12	9	11890	0.0572	2.8	0.5790	4.0	0.0741	2.6	500	46	461	11	461	11	7.8
TS-12	31	350000	0.0574	3.7	0.5850	5.1	0.0767	3.4	485	84	484.9	14	484.9	14	1.9
TS-12	40	1547	0.0574	0.3	0.6100	4.8	0.0771	3.0	505.2	7.7	505.2	13	505.2	13	5.2
TS-12	46	605	0.0574	0.5	0.6050	4.3	0.0763	3.4	509	12	509	16	509	16	6.9
TS-12	49	3133	0.0582	1.3	0.6750	4.0	0.0852	2.5	537	29	551.8	14	537	29	1.9
TS-12	53	923	0.0601	1.5	0.7810	7.6	0.0931	5.4	602	31	602	30	602	31	4.8
TS-12	105	4802	0.0663	3.0	1.2040	8.2	0.1357	6.1	808	61	842	46	808	61	-1.2
TS-12	98	2781	0.0666	0.3	1.1980	2.9	0.1308	2.5	823.5	6.5	823.9	18	823.5	6.5	3.8
TS-12	61	2196	0.0668	0.7	1.2240	2.8	0.1327	2.7	835	12	837	21	835	12	3.8
TS-12	104	738	0.0690	1.3	1.3730	5.5	0.1437	3.5	897	27	897	28	897	27	3.6
TS-12	7	577	0.0698	3.4	1.4450	5.3	0.1484	3.3	945	64	943	25	945	64	5.6
TS-12	118	19100	0.0717	1.7	1.5660	5.0	0.1603	3.6	975	32	997	33	975	32	1.7
TS-12	24	1767	0.0719	1.5	1.5650	5.8	0.1580	3.6	981	30	984	31	981	30	3.7
TS-12	112	3059	0.0724	1.5	1.6360	3.2	0.1659	2.7	997	31	989.1	23	997	31	0.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-12	27	569	0.0725	0.8	1.5670	7.7	0.1569	3.2	998	17	1000	26	998	17	5.9
TS-12	115	11500	0.0727	2.3	1.7570	3.8	0.1721	3.0	1024	32	1023	28	1024	32	0.1
TS-12	84	350000	0.0734	0.9	1.7550	3.2	0.1749	2.5	1024	18	1039.3	24	1024	18	-1.5
TS-12	10	9213	0.0742	1.8	1.7580	3.2	0.1727	2.7	1049	34	1026	25	1049	34	2.1
TS-12	78	4904	0.0742	1.8	1.8840	3.9	0.1834	2.7	1051	38	1086	25	1051	38	-3.2
TS-12	80	6133	0.0747	1.7	1.9720	3.6	0.1901	2.7	1064	35	1122	26	1064	35	-5.5
TS-12	95	4043	0.0757	0.8	1.8470	4.8	0.1775	2.8	1087	16	1089.6	25	1087	16	3.1
TS-12	73	11783	0.0758	0.9	1.8480	3.1	0.1756	2.4	1088	18	1042.1	24	1088	18	4.2
TS-12	64	5793	0.0770	1.6	1.9250	3.4	0.1835	2.5	1101	18	1086	25	1101	18	1.4
TS-12	15	6540	0.0776	1.1	2.0490	3.2	0.1924	2.4	1135	13	1134.3	26	1135	13	0.1
TS-12	14	585	0.0789	2.7	2.0600	9.7	0.1912	5.8	1155	55	1180	56	1155	55	2.7
TS-12	22	3711	0.0795	1.3	2.0680	3.9	0.1902	2.6	1181	25	1124	26	1181	25	5.0
TS-12	65	1855	0.0815	1.4	2.2120	3.7	0.1984	3.0	1229	27	1165	32	1229	27	5.1
TS-12	114	479	0.0820	2.7	2.1970	7.3	0.1955	3.9	1235	52	1166	37	1235	52	6.9
TS-12	79	1107	0.0833	3.7	2.3400	10.3	0.1997	4.1	1269	69	1217	38	1269	69	7.2
TS-12	48	743	0.0851	1.9	2.6550	3.8	0.2263	2.6	1311	37	1342	32	1311	37	-0.3
TS-12	32	845	0.0853	2.5	2.5420	5.5	0.2182	3.3	1317	49	1286.8	28	1317	49	3.4
TS-12	29	6744	0.0854	0.6	2.6290	3.3	0.2235	2.7	1325	12	1325.3	29	1325	12	1.9
TS-12	39	3815	0.0868	4.5	2.3900	8.8	0.1982	3.8	1331	84	1186	37	1331	84	12.5
TS-12	101	4329	0.0867	0.9	2.7120	3.3	0.2275	2.7	1353	18	1323	30	1353	18	2.4
TS-12	52	11613	0.0875	0.9	2.8500	3.3	0.2379	2.4	1371	18	1374.9	30	1371	18	-0.4
TS-12	35	11771	0.0880	1.1	3.0350	3.2	0.2506	2.5	1378	13	1441	32	1378	13	-4.6
TS-12	66	1088	0.0884	2.3	2.7960	4.6	0.2349	2.8	1385	45	1363	33	1385	45	1.7
TS-12	70	2965	0.0884	1.4	2.9450	3.3	0.2415	2.4	1394	19	1395.7	30	1394	19	-0.1
TS-12	20	16030	0.0887	1.9	2.8590	4.9	0.2358	2.8	1401	36	1372	32	1401	36	2.4
TS-12	106	7137	0.0893	1.3	3.0400	3.9	0.2453	2.8	1407	25	1414	33	1407	25	-0.5
TS-12	41	11233	0.0893	1.9	2.9490	4.7	0.2421	3.0	1411	34	1395	34	1411	34	1.0
TS-12	44	2138	0.0916	2.8	3.1670	4.1	0.2525	2.9	1445	30	1451	37	1445	30	-0.4
TS-12	43	1927	0.0962	1.0	3.5590	3.4	0.2721	2.5	1550	20	1551	34	1550	20	-0.1
TS-12	28	47467	0.1005	0.8	4.1370	2.9	0.2943	2.4	1632	14	1664	35	1632	14	-1.9
TS-12	56	4371	0.1014	0.9	3.8720	3.6	0.2781	2.6	1648	16	1582	37	1648	16	4.1
TS-12	76	20060	0.1024	1.8	4.1230	3.4	0.2920	2.6	1669	16	1651	37	1669	16	1.1
TS-12	74	7923	0.1031	0.9	4.0630	3.2	0.2890	2.6	1680	16	1637	36	1680	16	2.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-12	2	19880	0.1030	1.0	4.1120	3.2	0.2916	2.4	1686	15	1650	35	1686	15	2.1
TS-12	4	29067	0.1035	1.3	4.2460	3.3	0.2989	2.4	1687	14	1686	36	1687	14	0.1
TS-12	72	44410	0.1038	1.3	4.1680	3.6	0.2937	2.7	1694	26	1658	39	1694	26	2.1
TS-12	45	6293	0.1039	1.2	4.1500	3.9	0.2931	3.1	1695	22	1654	45	1695	22	2.3
TS-12	117	19336	0.1042	0.8	4.0170	3.2	0.2780	2.4	1699.1	15	1580.4	34	1699.1	15	6.9
TS-12	94	4856	0.1040	1.4	4.1820	3.1	0.2951	2.6	1700	16	1666	39	1700	16	2.0
TS-12	3	8200	0.1044	1.4	4.1500	5.3	0.2869	4.2	1701	27	1626	58	1701	27	4.6
TS-12	89	12714	0.1041	0.9	4.5390	3.1	0.3195	2.4	1707	13	1787	38	1707	13	-4.7
TS-12	111	3267	0.1045	0.9	4.1070	2.9	0.2828	2.4	1708	16	1606.6	34	1708	16	6.0
TS-12	34	46175	0.1048	0.8	4.1110	3.4	0.2849	2.5	1710	14	1617	37	1710	14	5.4
TS-12	113	4872	0.1050	1.1	4.2250	3.8	0.2916	2.6	1711	21	1654	35	1711	21	3.6
TS-12	42	1834	0.1045	2.2	4.2400	4.2	0.2985	2.8	1714	42	1680	37	1714	42	1.8
TS-12	47	3847	0.1049	1.0	4.4000	3.2	0.3049	2.6	1714	19	1714	38	1714	19	-0.2
TS-12	71	2708	0.1053	1.9	4.2700	4.0	0.2942	2.8	1722	33	1666	37	1722	33	3.5
TS-12	63	1468	0.1055	3.4	4.6100	6.1	0.3172	3.5	1726	57	1775	48	1726	57	-2.8
TS-12	90	8000	0.1062	1.9	4.1630	3.4	0.2883	2.5	1738	19	1633	36	1738	19	6.0
TS-12	85	28600	0.1065	0.9	4.3010	3.3	0.2964	2.5	1744	17	1673	36	1744	17	4.1
TS-12	1	1310	0.1067	1.2	4.1550	3.4	0.2875	2.6	1746	21	1632	35	1746	21	6.7
TS-12	68	3373	0.1070	1.2	4.3080	3.5	0.2956	2.6	1747	22	1670	38	1747	22	4.5
TS-12	108	995	0.1075	1.6	4.3440	3.0	0.2965	2.5	1756	29	1688	41	1756	29	4.7
TS-12	102	137200	0.1076	1.3	4.4300	4.7	0.2987	3.7	1761	25	1686	54	1761	25	4.4
TS-12	11	7038	0.1081	0.8	4.6740	3.2	0.3173	2.6	1767	15	1774	39	1767	15	-0.5
TS-12	92	6813	0.1091	1.4	4.5950	3.7	0.3102	2.7	1784	24	1742	39	1784	24	2.4
TS-12	13	5773	0.1096	0.9	4.6760	3.8	0.3123	2.4	1794	17	1750	37	1794	17	2.3
TS-12	110	26700	0.1146	0.7	5.2340	3.1	0.3280	2.4	1870.5	11	1828	39	1870.5	11	2.3
TS-13	80	321	0.0466	6.2	0.0938	5.8	0.0148	2.4	296	61	94.4	2.3	94.4	2.3	68.1
TS-13	106	4080	0.0479	2.7	0.0982	2.6	0.0148	1.4	154	25	94.46	1.3	94.46	1.3	38.7
TS-13	71	1758	0.0491	4.7	0.0977	2.0	0.0151	2.1	42	18	97.1	1.9	97.1	1.9	71.4
TS-13	2	1753	0.0509	6.7	0.0973	2.3	0.0152	2.3	22	16	97.3	2.2	97.3	2.2	76.3
TS-13	5	539	0.0466	6.7	0.0963	6.1	0.0153	2.4	402	75	97.9	2.4	97.9	2.4	75.6
TS-13	77	246	0.0561	7.8	0.1173	8.0	0.0153	2.2	538	81	98.1	2.2	98.1	2.2	81.8
TS-13	22	350000	0.0502	4.4	0.0997	1.6	0.0155	1.9	41	15	99.2	1.7	99.2	1.7	60.5
TS-13	28	2760	0.0496	4.8	0.1061	4.4	0.0156	1.9	300	51	99.5	1.9	99.5	1.9	66.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-13	73	604	0.0474	5.7	0.1011	2.1	0.0158	2.3	21	14	100.9	2.2	100.9	2.2	73.0
TS-13	18	739	0.0530	4.2	0.1688	4.3	0.0230	1.6	403	64	146.7	2.3	146.7	2.3	63.6
TS-13	3	672	0.0549	6.6	0.1800	5.6	0.0238	2.2	535	64	152	3.3	152	3.3	71.6
TS-13	67	115	0.2069	1.2	0.1824	5.1	0.0267	4.5	147	24	212	8.8	212	8.8	92.6
TS-13	100	504	0.0525	5.3	0.2620	5.3	0.0356	2.0	421	62	225.6	4.5	225.6	4.5	46.4
TS-13	40	425	0.0511	4.3	0.2347	1.9	0.0355	1.9	90	29	226.3	3.7	226.3	3.7	30.4
TS-13	120	380	0.0500	3.8	0.2411	2.0	0.0360	1.9	115	28	229.1	4	229.1	4	25.4
TS-13	110	1182	0.0488	3.1	0.2409	1.7	0.0363	1.6	105	28	230.2	3.4	230.2	3.4	9.7
TS-13	21	3806	0.0500	2.4	0.2500	2.4	0.0366	1.4	244	29	231.6	3.1	231.6	3.1	5.1
TS-13	78	54	0.3401	1.9	0.1666	1.3	0.0237	1.3	242.1	5.3	236.7	4.9	236.7	4.9	93.5
TS-13	36	300	0.0576	3.6	0.2464	2.2	0.0374	2.0	91	31	240.3	4.1	240.3	4.1	54.6
TS-13	85	542	0.0982	1.0	0.2530	4.0	0.0376	3.2	136	29	253.7	7.9	253.7	7.9	84.0
TS-13	101	496	0.1104	0.9	0.3190	4.4	0.0440	4.1	299	11	299	12	299	12	83.4
TS-13	51	1605	0.0808	0.8	0.3026	4.3	0.0462	2.8	74	35	304.6	7.6	304.6	7.6	75.1
TS-13	23	170	0.1599	0.7	0.3470	5.5	0.0523	5.5	120	16	382	21	382	21	84.4
TS-13	94	4188	0.0948	0.5	0.4342	0.9	0.0580	1.3	382.5	2.2	382.5	4.8	382.5	4.8	74.9
TS-13	64	121	0.1935	0.8	0.3833	0.8	0.0511	1.4	388.7	2.4	386.9	4.6	386.9	4.6	86.0
TS-13	30	883	0.0961	0.7	0.5185	0.8	0.0674	1.4	442.4	2.3	442.4	5.3	442.4	5.3	71.5
TS-13	59	1050	0.0980	0.7	0.5348	0.7	0.0692	1.3	454.9	2.2	454.9	5.4	454.9	5.4	71.3
TS-13	104	738	0.1044	0.7	0.5980	6.4	0.0758	4.9	499.1	22	499.1	23	499.1	23	70.6
TS-13	29	649	0.1093	0.9	0.6459	1.1	0.0807	1.4	534.1	4.1	534.1	7	534.1	7	70.2
TS-13	55	6828	0.0999	0.4	0.7920	4.5	0.0950	3.5	614	18	614	20	614	18	62.1
TS-13	62	2330	0.0622	2.3	0.9440	1.6	0.1112	1.5	665	31	680	9	665	31	0.7
TS-13	68	1791	0.0982	0.4	0.9410	3.0	0.1088	2.5	695	13	695	16	695	13	56.3
TS-13	108	10736	0.0792	0.4	0.9730	1.3	0.1124	1.5	700.7	5.8	700.7	9.6	700.7	5.8	40.6
TS-13	41	4405	0.0912	0.6	0.9713	0.8	0.1120	1.3	707.2	3.3	707.2	8.2	707.2	3.3	51.3
TS-13	107	13037	0.0832	0.5	1.0449	0.9	0.1186	1.3	738.5	3.5	738.9	8.4	738.5	3.5	42.1
TS-13	12	25367	0.0973	0.6	1.1140	1.4	0.1241	1.5	782	6.9	782	11	782	6.9	50.4
TS-13	42	4709	0.1053	0.6	1.3190	1.4	0.1398	1.5	881.1	7.7	881.1	12	881.1	7.7	48.8
TS-13	96	7711	0.0985	0.7	1.4130	3.0	0.1475	2.4	917	19	917	21	917	19	42.5
TS-13	50	11380	0.1023	0.5	1.6180	2.5	0.1618	2.0	998	15	999	18	998	15	39.9
TS-13	115	1907	0.0746	2.4	1.8950	3.0	0.1831	1.5	1074	28	1084	15	1074	28	-0.9
TS-13	1	856	0.0768	2.1	1.8470	1.9	0.1786	1.5	1077	29	1066	14	1077	29	4.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-13	9	1257	0.0743	2.8	1.8620	2.6	0.1803	1.7	1079	31	1068	17	1079	31	1.0
TS-13	33	350000	0.0747	2.3	1.9010	2.4	0.1824	1.5	1083	35	1081.3	14	1083	35	-0.4
TS-13	119	196	0.0733	4.8	1.8600	4.5	0.1854	2.4	1103	53	1101	25	1103	53	0.2
TS-13	114	8993	0.0770	1.6	2.0320	1.6	0.1906	1.4	1126	19	1124.5	14	1126	19	0.1
TS-13	45	1360	0.0903	3.1	2.6600	4.9	0.2324	2.5	1295	63	1354	24	1295	63	3.6
TS-13	79	275	0.0918	4.2	2.6900	4.5	0.2302	2.6	1346	57	1353	23	1346	57	8.9
TS-13	76	1091	0.0858	1.7	2.8940	1.8	0.2428	1.4	1355	19	1401	17	1355	19	-3.4
TS-13	26	3070	0.0873	1.3	2.8870	1.2	0.2389	1.3	1372	13	1380.9	17	1372	13	-0.6
TS-13	70	1466	0.0863	2.2	2.8210	2.1	0.2370	1.6	1379	22	1373	20	1379	22	0.4
TS-13	89	3240	0.0876	2.2	2.8820	2.4	0.2419	1.6	1384	39	1400	18	1384	39	-0.4
TS-13	19	7311	0.0880	1.0	2.9170	1.1	0.2394	1.3	1384	10	1385.4	15	1384	10	-0.2
TS-13	103	350000	0.0882	0.6	2.9670	0.9	0.2438	1.2	1384.2	6.2	1406.5	16	1384.2	6.2	-1.6
TS-13	84	2293	0.0875	1.5	2.8970	1.9	0.2405	1.3	1385	26	1386	17	1385	26	-0.8
TS-13	35	1933	0.0882	1.7	2.9730	1.7	0.2445	1.3	1393	16	1410	16	1393	16	-1.2
TS-13	17	1484	0.0886	1.9	2.8920	1.8	0.2359	1.4	1395	17	1365	18	1395	17	2.2
TS-13	15	22000	0.0886	1.8	3.0520	2.3	0.2477	1.7	1396	32	1425	20	1396	32	-1.5
TS-13	95	9335	0.0892	0.6	3.0050	0.9	0.2453	1.2	1398.7	8.4	1414.3	16	1398.7	8.4	-1.1
TS-13	43	1659	0.0876	1.8	2.8920	1.8	0.2390	1.5	1399	32	1381	18	1399	32	0.6
TS-13	39	420	0.1022	4.5	2.8400	4.9	0.2372	2.1	1403	71	1405	24	1403	71	14.3
TS-13	102	2599	0.0897	1.1	3.0420	1.4	0.2459	1.4	1412	19	1417	17	1412	19	-0.5
TS-13	53	1403	0.0889	1.7	2.9780	1.6	0.2419	1.4	1420	18	1396	18	1420	18	1.7
TS-13	90	2610	0.0984	0.7	3.8830	1.0	0.2867	1.2	1597.6	8.7	1626.7	17	1597.6	8.7	-2.1
TS-13	20	3130	0.1011	0.9	4.0060	1.0	0.2879	1.2	1637	11	1632.3	18	1637	11	0.2
TS-13	46	19675	0.1017	0.6	4.1270	1.0	0.2935	1.2	1648.7	6.5	1659	18	1648.7	6.5	-0.6
TS-13	11	898	0.1042	2.7	4.0900	4.4	0.2958	2.1	1649	68	1681	28	1649	68	0.6
TS-13	86	4075	0.1019	1.0	4.1690	1.2	0.2971	1.3	1652	12	1677	19	1652	12	-1.5
TS-13	117	60600	0.1019	0.7	4.1100	0.9	0.2926	1.2	1659.3	8.6	1654.1	18	1659.3	8.6	0.2
TS-13	34	1630	0.1030	2.3	4.0400	3.0	0.2917	1.7	1660	51	1657	22	1660	51	1.9
TS-13	69	8970	0.0990	1.6	4.1400	2.7	0.2943	1.8	1660	28	1658	23	1660	28	-3.6
TS-13	81	9005	0.1021	0.7	4.1310	1.0	0.2948	1.2	1661	7.6	1663.7	18	1661	7.6	-0.3
TS-13	4	11233	0.1019	1.3	4.1480	1.4	0.2974	1.4	1663	18	1677	20	1663	18	-0.1
TS-13	49	13700	0.1022	0.8	4.1150	1.0	0.2943	1.2	1663.4	7.8	1663.1	18	1663.4	7.8	0.0
TS-13	92	12963	0.1026	1.4	4.2350	1.5	0.2991	1.4	1670	14	1686	21	1670	14	-1.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-13	105	5269	0.1022	0.9	4.1880	1.0	0.2973	1.2	1671	11	1677.8	18	1671	11	-0.3
TS-13	66	9810	0.1030	0.6	4.2260	0.9	0.2970	1.3	1674.3	8.6	1677	20	1674.3	8.6	0.1
TS-13	56	7083	0.1023	1.2	4.2460	1.1	0.3005	1.3	1675	14	1691	19	1675	14	-0.8
TS-13	74	16433	0.1029	0.6	4.2370	0.8	0.3001	1.2	1676.5	6.4	1691.9	18	1676.5	6.4	-0.8
TS-13	116	12282	0.1031	0.7	4.2040	0.9	0.2960	1.2	1677.9	7.7	1672.3	18	1677.9	7.7	0.3
TS-13	10	4856	0.1031	1.1	4.2670	1.3	0.2977	1.3	1680	16	1679.8	18	1680	16	-0.2
TS-13	48	1588	0.1027	1.5	4.2080	1.7	0.2945	1.5	1684	19	1663	20	1684	19	1.1
TS-13	16	344100	0.1034	0.5	4.1740	0.8	0.2930	1.2	1687.7	5.9	1656.5	17	1687.7	5.9	1.8
TS-13	83	1999	0.1007	2.2	4.2500	2.6	0.2976	1.6	1690	40	1679	22	1690	40	-1.5
TS-13	99	2012	0.1033	1.2	4.4760	1.4	0.3107	1.6	1692	15	1744	23	1692	15	-3.7
TS-13	13	12782	0.1048	0.6	4.3200	0.9	0.3003	1.2	1698.7	6.2	1692.6	18	1698.7	6.2	0.4
TS-13	91	17169	0.1042	1.0	4.2510	1.0	0.2972	1.2	1699	14	1676.8	18	1699	14	1.6
TS-13	31	1765	0.1058	1.5	4.3080	1.6	0.2976	1.4	1703	17	1679	20	1703	17	1.4
TS-13	118	1200	0.1035	1.4	4.0500	2.2	0.2887	1.7	1708	29	1635	24	1708	29	4.4
TS-13	87	21720	0.1049	1.1	4.4570	1.2	0.3073	1.3	1713	13	1726.7	19	1713	13	-0.4
TS-13	6	350	0.1038	3.0	4.2600	3.1	0.2975	1.8	1715	37	1678	26	1715	37	2.2
TS-13	37	700	0.1039	2.6	4.2600	2.3	0.2973	1.6	1716	26	1677	23	1716	26	2.3
TS-13	111	15125	0.1073	0.8	4.6870	1.2	0.3155	1.4	1755	10	1766	20	1755	10	-0.8
TS-13	82	166050	0.1115	0.6	4.8850	0.9	0.3166	1.2	1823.8	5.5	1772.9	19	1823.8	5.5	2.8
TS-13	61	30100	0.1119	0.6	5.1110	0.8	0.3300	1.2	1828.6	7	1838.5	20	1828.6	7	-0.5
TS-13	112	7793	0.1818	1.0	12.9800	1.2	0.5160	1.3	2682	9	2682	29	2682	9	0.0
TS-14	89	3705	0.0023	6.4	0.8240	8.1	0.0789	3.3	266	55	89.1	1.3	89.1	1.3	66.5
TS-14	9	325	0.0019	3.9	3.1040	2.9	0.2357	0.8	254	38	92.6	1.1	92.6	1.1	63.5
TS-14	64	133	0.0463	0.5	0.0929	4.2	0.0146	3.8	13	11	95.6	3	95.6	3	-616.2
TS-14	34	311	0.0029	6.3	4.8700	3.1	0.3411	1.5	372	58	96	1.9	96	1.9	74.2
TS-14	14	10	0.0005	84.6	0.0975	1.8	0.0151	1.7	24	94.5	97	1.4	97	1.4	93.3
TS-14	118	88	0.0461	0.2	0.0977	4.1	0.0153	4.0	3.8	3.8	98.7	2.4	98.7	2.4	-2471.1
TS-14	119	122	0.0073	10.7	2.2100	12.7	0.1513	0.8	670	110	100.9	3.5	100.9	3.5	84.9
TS-14	86	37	0.0462	0.2	0.0957	4.8	0.0152	4.6	7.2	5.3	105.6	3.6	105.6	3.6	-1247.2
TS-14	42	371	0.0480	1.5	0.1540	1.9	0.0235	1.5	97	34	150.4	2.3	150.4	2.3	-54.1
TS-14	8	310	0.0500	0.8	0.2261	2.7	0.0328	2.2	190	20	228.8	6	228.8	6	-9.6
TS-14	19	350000	0.0525	2.1	0.4840	2.3	0.0665	1.1	297	47	414.9	3.6	414.9	3.6	-39.6
TS-14	55	1685	0.0041	6.4	0.1090	11.0	0.0158	3.5	851	70	444	8.4	444	8.4	47.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-14	35	1094	0.0552	1.3	0.5305	1.8	0.0713	1.0	428	27	445.4	3.6	445.4	3.6	-3.8
TS-14	27	1595	0.0569	1.2	0.5780	2.1	0.0744	1.1	486	26	464.4	5.1	464.4	5.1	4.8
TS-14	22	1329	0.0494	4.0	0.5300	6.6	0.0763	2.8	147	89	490	15	490	15	-222.4
TS-14	120	1426	0.0013	2.6	2.3140	6.1	0.1974	1.2	527	25	496.2	3	496.2	3	5.8
TS-14	48	6213	0.0589	1.5	0.6600	2.1	0.0825	1.3	556	33	514.7	6.2	514.7	6.2	8.1
TS-14	69	741	0.0587	2.9	0.8290	3.7	0.1027	2.3	541	70	633	9.3	541	70	-16.5
TS-14	60	635	0.0598	2.0	0.7110	2.7	0.0886	1.5	591	42	550	6.7	550	6.7	7.4
TS-14	18	1862	0.0641	0.7	1.0360	2.8	0.1168	2.1	742	14	742	14	742	14	4.0
TS-14	103	1426	0.0693	0.6	1.3800	2.2	0.1442	1.6	908	12	908	6.9	908	12	4.4
TS-14	28	27160	0.0015	2.6	5.1400	4.3	0.3192	1.2	953	28	940.4	7	953	28	1.3
TS-14	72	765	0.0710	2.0	1.5050	4.3	0.1535	2.8	954	43	972	20	954	43	3.6
TS-14	76	652	0.0713	2.4	1.6130	3.2	0.1685	1.6	964	53	1006	13	964	53	-4.1
TS-14	30	8074	0.0729	0.6	1.8280	0.9	0.1797	0.5	1010	13	1065	5.3	1010	13	-5.4
TS-14	110	1420	0.0022	3.3	0.2490	10.0	0.0165	3.5	1016	41	1084	13	1016	41	-6.7
TS-14	10	751	0.0745	2.4	1.8400	3.0	0.1778	1.4	1049	50	1059	15	1049	50	-0.6
TS-14	29	1436	0.0744	1.7	1.8510	1.9	0.1803	0.9	1051	35	1073	9.1	1051	35	-1.7
TS-14	81	2685	0.0750	1.6	1.8420	2.0	0.1788	1.2	1070	33	1063	11	1070	33	0.9
TS-14	11	961	0.0753	2.0	1.7080	2.5	0.1674	1.3	1083	39	1004	8.6	1083	39	7.9
TS-14	73	1394	0.0019	3.2	4.0890	3.2	0.2742	0.8	1085	27	1062	14	1085	27	2.1
TS-14	23	1107	0.0022	3.3	2.1310	4.5	0.1890	1.9	1088	34	1087	12	1088	34	0.1
TS-14	68	19760	0.0761	1.6	1.9180	2.2	0.1853	1.1	1101	31	1096	11	1101	31	0.5
TS-14	87	3729	0.0766	3.1	1.6900	3.7	0.1663	1.7	1103	64	998	20	1103	64	10.2
TS-14	12	1548	0.0017	2.3	0.1280	10.2	0.0154	2.4	1118	30	1167	12	1118	30	-4.4
TS-14	49	433	0.0774	2.5	1.9680	4.1	0.1874	2.6	1127	51	1115	19	1127	51	1.9
TS-14	31	11983	0.0770	1.3	1.9610	1.7	0.1857	0.9	1132	28	1099	8.2	1132	28	3.0
TS-14	109	3311	0.0793	0.4	2.1330	1.3	0.1949	0.8	1178.3	8.6	1179.3	8.5	1178.3	8.6	2.6
TS-14	58	997	0.0809	2.1	2.3320	2.7	0.2091	1.4	1216	43	1224	14	1216	43	-0.6
TS-14	106	7216	0.0812	1.5	2.2570	1.8	0.2023	1.1	1223	29	1188	11	1223	29	2.9
TS-14	17	6857	0.0810	1.5	2.1980	1.9	0.1970	0.9	1227	31	1159.1	9.3	1227	31	5.5
TS-14	116	821	0.0821	3.5	2.3840	3.4	0.2129	1.3	1246	71	1266	49	1246	71	0.2
TS-14	88	917	0.0823	1.5	2.1920	2.4	0.1962	1.3	1250	30	1161	13	1250	30	7.6
TS-14	7	2498	0.0826	1.5	2.3280	1.7	0.2090	1.0	1257	30	1225	10	1257	30	2.7
TS-14	5	6791	0.0836	0.5	2.4560	0.8	0.2135	0.5	1281.6	9.1	1246.7	5.8	1281.6	9.1	2.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-14	90	1220	0.0015	2.0	4.8500	4.9	0.2946	5.1	1291	20	1226	9.1	1291	20	5.0
TS-14	13	1030	0.0842	2.3	2.6280	2.6	0.2241	1.1	1311	42	1305	12	1311	42	0.5
TS-14	24	12620	0.0861	1.5	2.5770	2.1	0.2212	0.9	1334	29	1291.5	9.9	1334	29	3.4
TS-14	94	5920	0.0867	1.4	2.7690	2.3	0.2318	0.9	1352	29	1344	10	1352	29	0.6
TS-14	15	1842	0.0881	1.0	2.9620	1.4	0.2430	0.7	1384	20	1400.1	9.1	1384	20	-1.3
TS-14	6	3054	0.0884	2.4	2.6270	3.2	0.2200	1.7	1387	44	1288	40	1387	44	7.6
TS-14	37	350000	0.0894	1.1	2.9960	1.5	0.2450	0.8	1416	20	1410.2	9.6	1416	20	0.3
TS-14	84	4112	0.0898	0.4	2.9070	0.7	0.2343	0.5	1421.3	8.3	1358.1	5.8	1421.3	8.3	4.5
TS-14	26	23360	0.0899	2.3	3.0840	2.7	0.2502	1.6	1432	50	1441	17	1432	50	-0.5
TS-14	96	3932	0.0919	0.9	3.1030	1.3	0.2453	0.7	1466	18	1413.9	7.8	1466	18	3.5
TS-14	62	806	0.0939	4.2	2.9500	4.7	0.2300	1.7	1498	78	1367	63	1498	78	10.9
TS-14	61	223	0.0972	4.2	3.2700	5.2	0.2440	1.5	1562	79	1526	14	1562	79	9.9
TS-14	77	2084	0.1003	1.4	4.0140	2.4	0.2872	1.0	1628	27	1627	14	1628	27	0.1
TS-14	63	3349	0.1022	3.4	3.9900	5.5	0.2925	2.6	1637	72	1674	35	1637	72	-1.5
TS-14	104	6787	0.1010	0.6	4.0490	1.1	0.2910	0.8	1642	11	1646	9.4	1642	11	-0.2
TS-14	56	350000	0.1008	0.9	3.9690	1.6	0.2875	1.0	1642	17	1630	14	1642	17	0.7
TS-14	114	253	0.1011	3.5	4.1300	4.1	0.2965	1.4	1648	65	1779	13	1648	65	-1.5
TS-14	20	4169	0.1018	0.9	4.1700	1.4	0.2957	0.7	1658	18	1669	11	1658	18	-0.7
TS-14	78	463	0.1028	3.1	3.9200	3.8	0.2830	1.3	1675	60	1647	25	1675	60	4.1
TS-14	95	2297	0.1030	0.8	4.2770	1.3	0.3000	0.7	1677	15	1689.1	9.7	1677	15	-0.8
TS-14	43	14973	0.0008	1.6	0.5510	3.6	0.0715	0.9	1681.1	8.8	1208	28	1681.1	8.8	28.1
TS-14	75	862	0.1034	1.6	3.8460	2.3	0.2724	1.0	1682	32	1562	11	1682	32	7.7
TS-14	2	31470	0.1043	0.9	4.4030	1.2	0.3043	0.8	1700	16	1713	12	1700	16	-0.7
TS-14	80	2491	0.1045	1.2	3.8850	1.6	0.2735	0.9	1711	22	1555	12	1711	22	8.9
TS-14	105	4467	0.1052	1.3	4.6850	1.5	0.3186	1.0	1715	25	1785	14	1715	25	-4.1
TS-14	32	2663	0.1053	1.1	4.3570	1.8	0.3034	1.5	1717	21	1708	28	1717	21	0.6
TS-14	57	4738	0.1049	1.2	4.3540	1.6	0.3026	0.9	1718	22	1707	13	1718	22	0.8
TS-14	59	6259	0.1052	0.4	4.4280	1.0	0.3053	0.8	1718.1	8	1718	11	1718.1	8	0.1
TS-14	44	749	0.1069	5.3	4.6400	5.8	0.3171	2.0	1720	100	1785	19	1720	100	-3.2
TS-14	70	350000	0.1052	1.3	4.2940	1.6	0.2969	0.8	1723	26	1674	12	1723	26	2.7
TS-14	112	2159	0.0025	2.5	1.8560	15.6	0.1785	1.5	1731	30	1705	15	1731	30	1.5
TS-14	85	997	0.1066	2.2	4.5100	2.9	0.3075	1.3	1733	40	1723	18	1733	40	0.3
TS-14	21	5443	0.1062	0.6	4.4220	0.8	0.3005	0.5	1734	12	1693.6	7.2	1734	12	2.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-14	82	21920	0.1066	1.0	4.4360	1.5	0.3046	0.8	1740	19	1714	15	1740	19	1.5
TS-14	99	4489	0.1067	0.8	4.5370	1.2	0.3090	0.7	1743	14	1733	13	1743	14	0.4
TS-14	65	49857	0.0009	4.6	1.8280	4.6	0.1685	0.9	1749.5	9.8	1632	13	1749.5	9.8	6.7
TS-14	16	8270	0.1071	0.4	4.6780	0.8	0.3155	0.6	1749.7	7.3	1768.2	9.4	1749.7	7.3	-1.0
TS-14	97	867	0.1086	3.5	4.2600	4.7	0.2896	2.2	1757	69	1664	81	1757	69	6.5
TS-14	40	1444	0.1077	1.4	4.1550	2.0	0.2841	1.5	1759	25	1624	33	1759	25	8.4
TS-14	52	35200	0.1080	0.9	4.9350	1.2	0.3290	0.6	1763	17	1836	10	1763	17	-4.0
TS-14	33	4617	0.1074	1.7	4.2540	2.1	0.2901	1.1	1764	30	1648	15	1764	30	7.0
TS-14	25	21697	0.1095	0.8	4.7640	1.2	0.3164	0.7	1789	15	1773	11	1789	15	1.0
TS-14	107	4687	0.1101	0.6	4.8200	0.7	0.3171	0.7	1800	11	1775.3	9.9	1800	11	1.4
TS-14	51	2326	0.1105	0.8	4.9400	1.3	0.3224	0.9	1807	15	1803	20	1807	15	0.3
TS-14	71	3844	0.1104	1.1	4.8810	1.5	0.3220	0.9	1810	18	1804	13	1810	18	0.6
TS-14	91	754	0.0021	2.4	0.8670	5.2	0.1031	1.6	1812	18	1791	16	1812	18	1.2
TS-14	100	4867	0.1108	3.5	4.8900	4.5	0.3246	1.8	1817	61	1798	63	1817	61	0.3
TS-14	79	5880	0.1117	1.2	5.2800	2.1	0.3377	0.9	1825	21	1879	11	1825	21	-2.8
TS-14	101	350000	0.1135	3.9	5.6200	5.5	0.3545	1.7	1850	81	1960	22	1850	81	-5.7
TS-14	74	5737	0.0015	1.9	0.1710	5.4	0.0236	1.5	1865	13	1864	12	1865	13	0.1
TS-14	115	13338	0.1184	0.6	5.0620	0.9	0.3125	0.7	1932	11	1752	11	1932	11	9.3
TS-14	108	3726	0.1778	1.2	11.6100	1.3	0.4761	0.9	2631	20	2509	34	2631	20	4.6
TS-14	38	2688	0.0021	1.8	0.6040	3.8	0.0361	2.7	2705	9.6	2714	19	2705	9.6	-0.3
TS-14	50	9550	0.1879	1.2	13.5800	1.3	0.5269	0.9	2723	19	2732	19	2723	19	-0.2
TS-15	89	797	0.0469	1.0	0.0916	2.1	0.0143	1.9	39	21	92.7	1.6	92.7	1.6	-134.1
TS-15	30	528	0.0463	0.4	0.1014	3.4	0.0158	3.1	12	9.7	101.7	2.9	101.7	2.9	-740.0
TS-15	99	403	0.0054	5.2	0.1780	23.0	0.0160	3.2	1070	210	102.6	3.3	102.6	3.3	90.4
TS-15	8	711	0.0058	8.4	0.1490	22.1	0.0170	2.2	739	190	108.9	2.3	108.9	2.3	85.3
TS-15	49	79	0.0463	2.4	0.1650	15.2	0.0251	12.0	14	50	229	26	229	26	-1035.7
TS-15	15	156	0.0464	0.4	0.2626	1.2	0.0409	0.9	14	10	294.9	3.2	294.9	3.2	-1745.7
TS-15	80	468	0.0514	1.7	0.3702	1.8	0.0519	0.8	251	41	354.3	2.5	354.3	2.5	-30.0
TS-15	50	118	0.0536	0.6	0.3380	4.7	0.0456	3.9	355	14	355	12	355	12	19.2
TS-15	92	899	0.0197	2.8	0.4920	5.5	0.0612	1.4	490	80	382.8	5.4	382.8	5.4	21.9
TS-15	46	350000	0.0546	2.0	0.4950	2.2	0.0671	1.0	376	49	424.7	3.6	424.7	3.6	-11.3
TS-15	120	759	0.0226	4.4	0.5330	3.6	0.0697	1.2	397	43	434.1	5	434.1	5	-9.3
TS-15	20	571	0.0559	2.1	0.6900	2.8	0.0898	1.7	435	52	559.4	8.2	435	52	-27.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-15	94	350000	0.0537	2.4	0.5160	3.3	0.0701	1.9	335	57	442.2	17	442.2	17	-30.3
TS-15	100	1480	0.0512	2.3	0.4890	3.7	0.0701	2.4	232	51	464.6	9	464.6	9	-88.4
TS-15	5	1591	0.0566	0.2	0.5875	1.0	0.0754	0.9	476.9	5.3	477.7	3.8	477.7	3.8	1.7
TS-15	11	67	0.0561	1.1	0.4230	4.5	0.0554	3.6	452	25	478.6	6.9	478.6	6.9	23.2
TS-15	113	272	0.0569	0.7	0.5190	3.3	0.0677	2.7	488	15	481	12	481	12	13.5
TS-15	114	1126	0.0264	4.9	0.6500	3.5	0.0787	1.1	579	48	488.2	5.3	488.2	5.3	15.7
TS-15	45	585	0.0578	2.4	0.7600	2.8	0.0958	1.0	496	56	614.1	6.2	496	56	-18.8
TS-15	67	207	0.0546	2.4	0.5320	5.5	0.0705	3.8	380	59	501	18	501	18	-15.5
TS-15	91	1727	0.0292	6.5	0.6990	3.4	0.0866	1.8	513	38	535	9.3	535	9.3	-4.3
TS-15	109	153	0.0592	2.5	0.8220	3.0	0.1001	1.1	547	60	698	12	547	60	-12.4
TS-15	32	1937	0.0569	2.1	0.6880	2.3	0.0879	1.1	549	51	544.6	5.3	549	51	1.1
TS-15	38	179	0.0588	0.7	0.6334	2.4	0.0782	1.5	560	15	561.9	11	560	15	13.3
TS-15	51	2407	0.0606	1.7	0.7520	2.5	0.0919	1.7	622	38	577	8.7	622	38	8.8
TS-15	71	6113	0.0312	3.2	0.8410	2.7	0.0994	0.9	651	36	611.4	5.5	651	36	6.1
TS-15	121	366	0.0625	6.2	0.8820	26.1	0.1022	11.7	692	95	692	71	692	95	9.3
TS-15	74	959	0.0650	2.6	1.0700	7.4	0.1173	4.2	772	47	765	29	772	47	7.4
TS-15	87	327	0.0673	1.6	1.1680	3.9	0.1274	2.3	846	32	843	18	846	32	8.6
TS-15	105	471	0.0767	3.0	1.9990	3.3	0.1928	1.2	1096	59	1182	9.9	1096	59	-3.6
TS-15	33	18750	0.0592	2.0	2.0750	0.9	0.1925	0.7	1142	14	1135	7.5	1142	14	0.6
TS-15	93	308	0.0785	2.4	1.8800	6.9	0.1744	5.4	1152	54	1121	48	1152	54	10.2
TS-15	82	4537	0.0794	1.0	2.1210	1.2	0.1960	0.6	1181	20	1153.9	6	1181	20	2.3
TS-15	70	29440	0.0577	3.8	2.0810	2.2	0.1892	0.8	1188	26	1117.8	8.3	1188	26	5.9
TS-15	65	637	0.0818	2.1	2.2060	2.8	0.1985	1.3	1242	41	1213	12	1242	41	6.0
TS-15	43	1376	0.0853	2.3	2.5270	2.7	0.2189	1.3	1307	46	1283	14	1307	46	2.4
TS-15	60	19350	0.0686	3.5	2.7510	2.0	0.2309	1.0	1344	23	1339	12	1344	23	0.4
TS-15	95	346	0.0876	2.9	2.7300	2.9	0.2264	1.0	1353	53	1386	13	1353	53	2.8
TS-15	36	428	0.0868	1.4	2.5600	2.8	0.2129	1.6	1363	27	1302	16	1363	27	8.7
TS-15	97	531	0.0731	3.0	3.1960	2.3	0.2522	1.4	1420	25	1449	18	1420	25	-2.0
TS-15	84	574	0.0896	5.1	3.0800	5.5	0.2497	1.7	1421	100	1501	16	1421	100	-1.1
TS-15	24	816	0.0699	3.0	3.0100	3.3	0.2387	1.4	1464	31	1379	18	1464	31	5.8
TS-15	31	150	0.0927	2.4	2.8710	2.2	0.2262	0.6	1475	47	1491.5	9.1	1475	47	10.9
TS-15	59	1657	0.0938	1.9	3.0350	2.5	0.2322	1.3	1501	35	1361	32	1501	35	10.3
TS-15	88	4814	0.0949	2.2	3.0560	2.8	0.2419	1.2	1512	45	1406	12	1512	45	7.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-15	98	5122	0.0958	2.3	3.0300	3.6	0.2375	1.8	1537	45	1382	20	1537	45	10.7
TS-15	103	6064	0.0957	2.5	3.1630	2.6	0.2419	0.7	1537	55	1407	15	1537	55	9.1
TS-15	9	5145	0.0975	2.4	3.4000	4.4	0.2520	3.4	1592	46	1454	42	1592	46	9.4
TS-15	7	231	0.0991	2.5	3.9700	3.0	0.2903	0.8	1603	52	1758	13	1603	52	-2.5
TS-15	35	712	0.1004	2.0	3.6900	2.0	0.2663	1.1	1621	37	1567	14	1621	37	6.1
TS-15	44	1072	0.1010	3.3	4.2500	3.3	0.3049	2.1	1636	63	1714	23	1636	63	-4.8
TS-15	56	2667	0.0849	1.9	4.1040	1.8	0.2937	0.9	1638	18	1660	13	1638	18	-1.3
TS-15	85	2760	0.0858	3.3	4.1010	1.5	0.2923	0.8	1645	16	1653	12	1645	16	-0.5
TS-15	78	10350	0.0846	3.1	4.1790	1.2	0.2871	0.8	1685.6	12	1627	12	1685.6	12	3.5
TS-15	48	312	0.1034	4.1	3.7100	7.5	0.2631	5.3	1687	83	1578	62	1687	83	10.8
TS-15	64	5265	0.1030	2.9	4.0000	4.3	0.2888	1.7	1692	59	1632	21	1692	59	3.4
TS-15	42	1283	0.0894	2.1	4.4140	1.6	0.3092	1.0	1698	19	1736	15	1698	19	-2.2
TS-15	119	10353	0.1051	1.7	4.3430	1.8	0.3024	0.9	1710	31	1703	13	1710	31	0.4
TS-15	21	1495	0.1051	1.8	4.1700	2.6	0.2911	1.0	1713	33	1663	13	1713	33	3.9
TS-15	55	960	0.0882	2.8	4.4200	2.0	0.3001	1.2	1718	24	1694	18	1718	24	1.4
TS-15	69	2255	0.0845	3.1	4.2450	2.8	0.2958	1.4	1718	45	1670	21	1718	45	2.8
TS-15	25	33500	0.1050	1.6	4.1400	2.1	0.2913	1.0	1719	30	1655	14	1719	30	4.2
TS-15	18	53750	0.1056	1.2	4.6610	1.8	0.3145	1.0	1724	23	1761	15	1724	23	-2.2
TS-15	68	12047	0.1060	1.1	4.3470	1.5	0.3017	0.7	1729	20	1701	11	1729	20	1.7
TS-15	34	27600	0.1057	0.9	4.3480	1.4	0.2982	0.5	1729	18	1683.1	7.6	1729	18	2.7
TS-15	102	9510	0.1061	1.0	4.3300	1.3	0.3009	0.8	1732	19	1694	12	1732	19	2.1
TS-15	23	10707	0.1066	1.4	4.0530	1.4	0.2750	1.3	1738	28	1573	17	1738	28	9.9
TS-15	63	5920	0.1061	1.4	4.5440	2.0	0.3075	1.2	1739	25	1730	17	1739	25	0.6
TS-15	96	18000	0.1068	0.7	4.5650	0.9	0.3089	0.6	1745.1	13	1735.6	8.3	1745.1	13	0.6
TS-15	75	1934	0.1069	1.1	4.1790	1.5	0.2931	0.7	1746	21	1662	11	1746	21	5.0
TS-15	107	36667	0.1073	1.1	4.6790	1.1	0.3120	0.6	1755	21	1751.8	8.7	1755	21	0.3
TS-15	90	13320	0.1080	0.9	4.5990	1.5	0.3092	0.7	1764	16	1738	11	1764	16	1.5
TS-15	14	4960	0.1082	1.2	4.4440	1.3	0.3076	0.7	1771	21	1730	11	1771	21	2.4
TS-15	61	1738	0.1091	1.7	4.2970	2.0	0.2928	1.0	1778	32	1667	14	1778	32	6.9
TS-15	104	1309	0.1096	2.0	4.2200	2.4	0.2850	1.3	1796	36	1618	17	1796	36	10.0
TS-15	10	2551	0.1111	1.3	4.4880	1.4	0.2955	0.7	1816	22	1675.4	9.3	1816	22	8.1
TS-15	19	1956	0.1109	2.8	4.3880	3.6	0.2862	2.2	1822	58	1624	29	1822	58	11.0
TS-15	77	3611	0.1117	0.8	5.0230	1.1	0.3267	0.6	1826	14	1825.2	9.2	1826	14	0.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-15	26	454	0.1130	2.3	4.6200	3.0	0.2985	1.4	1845	43	1726	20	1845	43	8.8
TS-15	72	9867	0.1145	2.0	4.7200	2.5	0.2996	1.4	1873	39	1693	20	1873	39	9.9
TS-15	22	10955	0.1174	1.6	5.5420	1.7	0.3433	0.8	1913	29	1907	13	1913	29	0.6
TS-15	52	66000	0.1942	0.8	14.1900	1.6	0.5317	0.9	2779.4	13	2751	21	2779.4	13	1.1
TS-16	38	2742	0.9600	0.1	0.0914	1.8	0.0144	2.2	65	23	91.8	1.8	91.8	1.8	6.0
TS-16	96	18250	0.7100	0.1	0.0945	1.5	0.0147	2.0	48	17	94.21	1.7	94.21	1.7	5.4
TS-16	26	1491	0.0050	6.6	0.0941	7.0	0.0148	2.6	300	56	94.8	2.4	94.8	2.4	68.4
TS-16	64	1725	0.0052	5.5	0.0994	3.1	0.0148	1.9	181	27	94.8	1.8	94.8	1.8	47.6
TS-16	80	2206	0.0047	4.9	0.1022	5.8	0.0149	2.5	419	62	95.1	2.4	95.1	2.4	77.3
TS-16	14	513	0.0053	5.3	0.1004	7.0	0.0149	2.3	353	66	95.5	2.2	95.5	2.2	72.9
TS-16	30	320	2.3000	0.0	0.0963	2.7	0.0150	3.0	32	13	95.9	2.7	95.9	2.7	16.0
TS-16	102	173	1.7000	0.0	0.0970	2.5	0.0151	2.7	45	22	97.3	2.4	97.3	2.4	11.9
TS-16	99	586	0.0049	3.7	0.0999	6.6	0.0154	2.6	345	64	98.3	2.6	98.3	2.6	71.5
TS-16	37	211	2.3000	0.0	0.0941	2.9	0.0148	3.1	6.1	5.5	98.6	2.9	98.6	2.9	24.6
TS-16	84	158	0.0048	6.1	0.0993	6.7	0.0155	2.8	373	76	99	2.8	99	2.8	73.5
TS-16	58	211	2.1000	0.0	0.1004	3.9	0.0153	3.2	44	16	99.6	8.8	99.6	8.8	12.0
TS-16	4	386	2.1000	0.0	0.1011	3.2	0.0158	3.4	18	9	101.9	3.2	101.9	3.2	14.9
TS-16	107	4880	0.0073	2.6	0.1565	2.9	0.0226	1.8	240	33	144.2	2.6	144.2	2.6	39.9
TS-16	114	972	0.7500	0.1	0.1549	2.1	0.0239	2.3	56	21	152.4	3.2	152.4	3.2	7.0
TS-16	29	1927	0.0086	3.1	0.1899	4.8	0.0272	2.3	346	46	172.7	3.9	172.7	3.9	50.1
TS-16	89	10930	0.0115	4.1	0.2529	2.8	0.0360	1.8	258	27	227.7	3.9	227.7	3.9	11.7
TS-16	44	830	0.3200	0.2	0.2469	1.8	0.0364	1.9	105	27	230.2	4.1	230.2	4.1	5.6
TS-16	119	3944	0.4200	0.2	0.2414	2.1	0.0363	2.3	87	33	230.3	4.4	230.3	4.4	9.8
TS-16	77	2630	0.2500	0.3	0.2515	1.8	0.0370	1.9	157	35	234.7	4	234.7	4	4.5
TS-16	100	350000	0.5800	0.1	0.2540	2.4	0.0383	2.6	60	25	242.2	5.7	242.2	5.7	12.5
TS-16	40	1090	0.3100	0.2	0.2665	2.0	0.0391	2.0	173	33	248.4	4.6	248.4	4.6	4.0
TS-16	15	573	0.0127	5.8	0.2530	5.1	0.0393	2.3	282	50	248.6	5.5	248.6	5.5	11.8
TS-16	116	2100	0.0200	10.5	0.4350	17.0	0.0486	11.3	643	91	305	33	305	33	52.6
TS-16	66	875	2.1000	0.1	0.5010	22.0	0.0634	15.8	422	100	422	62	422	62	35.7
TS-16	68	3845	0.0840	1.3	0.5910	2.7	0.0756	1.9	503	62	470.8	7.6	470.8	7.6	3.5
TS-16	104	2434	0.2600	0.2	0.9550	9.9	0.1099	6.4	698	64	698	39	698	64	21.2
TS-16	92	1812	0.2400	0.4	1.4660	5.2	0.1492	3.6	937	57	937	30	937	57	23.8
TS-16	52	536	0.1100	2.0	1.9600	3.7	0.1895	2.6	1052	59	1121	25	1052	59	9.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-16	6	985	0.0562	3.4	1.9060	2.6	0.1852	1.8	1079	28	1095	19	1079	28	-1.5
TS-16	11	3244	0.0490	3.7	1.6700	5.3	0.1578	2.2	1097	88	972.9	16	1097	88	17.9
TS-16	49	1532	0.0573	2.3	2.0570	2.3	0.1905	1.8	1136	24	1124	18	1136	24	1.1
TS-16	86	1565	0.0470	4.0	2.3860	2.8	0.2119	1.9	1243	54	1244	20	1243	54	4.3
TS-16	23	350000	0.0290	2.8	2.3910	1.8	0.2112	1.7	1246	25	1235.5	19	1246	25	2.8
TS-16	105	279	0.0970	2.2	2.8900	4.5	0.2398	2.7	1356	56	1386	29	1356	56	8.0
TS-16	74	41300	0.0724	1.5	2.9700	2.3	0.2468	1.8	1369	19	1422.9	22	1369	19	-3.9
TS-16	59	1639	0.0737	2.0	3.0050	2.2	0.2497	1.8	1374	25	1438	23	1374	25	-4.7
TS-16	110	6328	0.0718	1.2	2.9140	1.8	0.2395	1.7	1390.6	18	1384.1	21	1390.6	18	0.5
TS-16	12	1361	0.0330	4.8	3.1270	2.8	0.2529	1.8	1409	45	1458	23	1409	45	3.8
TS-16	112	149	0.1300	3.8	2.8500	6.3	0.2375	3.3	1418	75	1427	37	1418	75	15.0
TS-16	103	136200	0.0240	2.3	3.1080	1.8	0.2499	1.6	1428	16	1438.1	21	1428	16	2.0
TS-16	22	206	0.0780	5.9	3.6000	6.4	0.2687	3.1	1550	91	1678	31	1550	91	28.1
TS-16	51	1978	0.0832	3.7	3.9160	2.2	0.2865	1.8	1598	24	1624	26	1598	24	-1.6
TS-16	54	2372	0.0340	3.2	3.9650	2.1	0.2894	1.8	1616	27	1635	25	1616	27	3.6
TS-16	32	7181	0.0180	3.1	4.1160	1.9	0.2959	1.7	1644	17	1671.1	24	1644	17	2.0
TS-16	101	2048	0.0847	2.2	4.1310	2.0	0.2933	1.8	1650	23	1658	26	1650	23	-0.5
TS-16	47	7950	0.0876	2.3	4.1590	2.1	0.2988	1.7	1656	22	1685	26	1656	22	-1.8
TS-16	61	2573	0.0869	2.9	4.1840	2.2	0.2994	1.8	1657	25	1688	26	1657	25	-1.9
TS-16	46	8900	0.0859	1.7	4.1490	1.9	0.2974	1.6	1659	20	1678.3	24	1659	20	-1.2
TS-16	82	4153	0.0862	1.5	4.1970	1.7	0.2985	1.6	1661.7	17	1684	24	1661.7	17	-1.3
TS-16	13	3792	0.0320	3.4	4.2840	2.1	0.3030	1.8	1665	24	1704	25	1665	24	3.0
TS-16	41	1253	0.0360	5.3	4.3860	2.5	0.3079	1.9	1666	40	1737	27	1666	40	4.1
TS-16	76	9836	0.0860	1.9	4.0150	2.0	0.2840	1.8	1666.5	16	1611	26	1666.5	16	3.3
TS-16	85	11829	0.0886	1.4	4.2640	1.7	0.3027	1.6	1668.3	17	1705.4	24	1668.3	17	-2.2
TS-16	10	6400	0.0874	1.9	4.2010	1.8	0.2984	1.7	1670	18	1684.4	25	1670	18	-0.9
TS-16	45	4055	0.0300	2.8	4.4560	3.4	0.3150	2.1	1671	27	1765	30	1671	27	3.2
TS-16	63	37400	0.0877	2.7	4.2660	1.8	0.3017	1.7	1673	15	1700.7	25	1673	15	-1.7
TS-16	43	1739	0.0310	4.2	4.0820	2.4	0.2917	1.7	1675	35	1650	25	1675	35	3.4
TS-16	56	5418	0.0250	4.8	4.2610	2.1	0.2987	1.6	1677	27	1686	25	1677	27	3.2
TS-16	72	13967	0.0855	2.0	4.2040	2.1	0.2961	1.7	1677	19	1672	25	1677	19	0.3
TS-16	83	50200	0.0180	3.1	4.1950	1.7	0.2973	1.6	1677	20	1677.9	24	1677	20	1.8
TS-16	98	706	0.0837	4.8	4.2900	2.6	0.3004	1.9	1678	27	1693	28	1678	27	-0.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-16	95	4900	0.0872	3.0	4.2330	2.0	0.3001	1.7	1678	26	1692	26	1678	26	-0.8
TS-16	75	2253	0.0874	3.0	4.1950	2.3	0.2971	1.8	1679	24	1676	26	1679	24	0.2
TS-16	115	5183	0.0340	5.3	4.2900	2.6	0.3023	1.9	1679	34	1704	27	1679	34	3.6
TS-16	60	65500	0.0210	2.9	4.1190	1.7	0.2914	1.7	1679	19	1648.4	24	1679	19	2.3
TS-16	81	1160	0.0862	2.3	4.2260	2.2	0.2960	1.8	1680	25	1671	26	1680	25	0.5
TS-16	97	1105	0.0821	3.0	4.1570	2.6	0.2931	1.9	1681	26	1657	28	1681	26	1.4
TS-16	55	2628	0.0911	2.4	4.2750	13.1	0.3036	2.4	1682	84	1709	35	1682	84	-1.6
TS-16	113	7317	0.0888	2.0	4.3250	2.0	0.3057	1.8	1682	22	1719	27	1682	22	-2.2
TS-16	53	1677	0.0886	2.5	4.2070	1.9	0.2956	1.8	1684	17	1669	26	1684	17	0.9
TS-16	93	9570	0.0190	3.4	4.3030	1.9	0.3017	1.7	1684	20	1701	25	1684	20	2.3
TS-16	9	10220	0.0280	5.7	4.5320	2.4	0.3133	1.9	1684	34	1761	27	1684	34	3.4
TS-16	69	2314	0.0861	2.2	4.2470	2.1	0.3014	1.7	1685	22	1698	26	1685	22	-0.8
TS-16	111	10550	0.0280	2.5	4.2960	2.0	0.3011	1.7	1686	23	1696	26	1686	23	2.7
TS-16	31	24771	0.0923	6.1	4.0250	1.7	0.2821	1.7	1686.7	17	1601.8	24	1686.7	17	5.0
TS-16	70	350000	0.0200	4.0	4.4470	2.1	0.3096	1.6	1687	25	1737.7	26	1687	25	2.4
TS-16	33	2424	0.0230	3.6	4.2550	1.8	0.2985	1.7	1689	20	1684.5	25	1689	20	2.1
TS-16	67	4357	0.0865	1.8	4.2580	1.8	0.2979	1.7	1689	20	1680.9	25	1689	20	0.5
TS-16	120	7313	0.0861	2.4	4.2440	2.2	0.3021	1.8	1691	24	1702	26	1691	24	-0.7
TS-16	91	11400	0.0360	4.7	4.2430	2.8	0.2974	1.9	1696	38	1681	27	1696	38	3.8
TS-16	73	10427	0.0170	3.1	4.4450	1.7	0.3104	1.6	1698.1	20	1742.7	25	1698.1	20	2.1
TS-16	19	4057	0.0560	6.1	4.3700	4.3	0.3015	2.6	1702	60	1703	31	1702	60	6.4
TS-16	3	6691	0.0821	3.3	4.1620	1.8	0.2877	1.7	1702	14	1630	25	1702	14	4.2
TS-16	20	79700	0.0860	2.2	4.3030	1.8	0.2984	1.7	1704	16	1683	26	1704	16	1.2
TS-16	109	13006	0.0200	4.6	4.3000	2.0	0.2978	1.7	1717	23	1681.5	24	1717	23	2.6
TS-16	50	4293	0.0200	5.0	4.3350	1.8	0.3008	1.6	1719	21	1697.9	25	1719	21	2.6
TS-16	25	1665	0.0370	6.5	4.0600	3.0	0.2850	2.0	1724	45	1618	26	1724	45	4.6
TS-16	108	11157	0.0905	1.5	4.4630	1.7	0.3060	1.7	1736	16	1721	25	1736	16	0.9
TS-16	117	11608	0.0887	1.1	4.4750	1.9	0.3065	1.7	1737	23	1725	25	1737	23	0.7
TS-16	48	1158	0.0340	8.2	4.3000	2.8	0.2954	1.9	1738	50	1703	26	1738	50	7.7
TS-16	87	425	0.0610	5.4	4.2800	4.4	0.2946	2.6	1739	57	1661	31	1739	57	7.0
TS-16	5	2452	0.0937	3.6	4.6190	2.2	0.3151	1.7	1742	20	1766	27	1742	20	-1.4
TS-16	24	3963	0.0926	3.3	4.6690	2.0	0.3151	1.7	1753	21	1766	26	1753	21	-0.7
TS-16	118	4508	0.0390	7.2	4.6100	3.5	0.3161	2.2	1759	53	1768	30	1759	53	5.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-16	79	6461	0.0925	1.7	4.7200	1.7	0.3193	1.6	1761.3	18	1786.2	25	1761.3	18	-1.4
TS-16	62	27665	0.0170	3.6	4.8140	1.7	0.3213	1.7	1773	18	1797.1	26	1773	18	1.9
TS-16	57	791	0.0210	8.1	4.5950	2.2	0.3106	1.6	1780	30	1763	26	1780	30	5.9
TS-16	16	10653	0.0992	2.5	5.1830	1.9	0.3352	1.7	1838	18	1863	27	1838	18	-1.4
TS-16	90	47465	0.0160	4.8	5.7940	1.9	0.3558	1.7	1926	20	1962.1	28	1926	20	2.3
TS-16	78	13875	0.0150	7.3	11.8900	1.8	0.4945	1.7	2594	19	2590	37	2594	19	2.5
TS-16	35	2128	0.1513	1.9	14.2200	1.7	0.5429	1.7	2745.4	13	2795	39	2745.4	13	-1.8
TS-17	71	925	0.0470	0.8	0.0926	1.8	0.0142	1.8	48	17	90.8	1.6	90.8	1.6	-87.3
TS-17	6	5670	0.0469	1.0	0.0934	1.7	0.0143	1.8	42	24	91.8	1.6	91.8	1.6	-115.7
TS-17	106	211	0.0466	0.9	0.0961	2.6	0.0150	2.5	22	18	96.4	2.2	96.4	2.2	-323.2
TS-17	63	130	0.0465	0.9	0.0974	2.6	0.0153	2.8	22	17	98.2	2.5	98.2	2.5	-328.6
TS-17	2	122	0.0052	6.8	0.1014	2.5	0.0160	2.6	450	93	102.2	2.6	102.2	2.6	77.3
TS-17	49	428	0.0052	3.9	0.1073	1.8	0.0164	1.8	253	49	105.6	1.8	105.6	1.8	58.3
TS-17	91	252	0.0461	2.0	0.1014	27.6	0.0160	23.1	1.35	42	114.9	23	114.9	23	-7137.0
TS-17	40	377	0.0471	1.5	0.1486	2.0	0.0228	1.9	39	31	147.2	2.6	147.2	2.6	-260.5
TS-17	37	67490	0.0111	1.4	0.2519	2.6	0.0359	1.5	269	33	227.9	3.2	227.9	3.2	15.3
TS-17	45	527	0.0515	2.9	0.3850	4.2	0.0536	2.2	254	69	362.3	7.9	362.3	7.9	-29.9
TS-17	84	1853	0.0606	0.5	0.8072	3.1	0.0966	1.6	623.5	12	622.8	8.2	623.5	12	3.6
TS-17	73	20300	0.0609	0.7	0.8347	2.9	0.0993	1.6	637.3	14	637.3	9.3	637.3	14	3.3
TS-17	76	1851	0.0613	0.7	0.8550	2.8	0.1009	1.7	649.4	15	649.4	9.9	649.4	15	3.5
TS-17	62	3470	0.0624	2.2	0.9260	5.4	0.1070	3.6	685	48	685	23	685	48	3.4
TS-17	17	4450	0.0625	3.5	0.9310	6.7	0.1078	4.3	691	70	691	27	691	70	3.6
TS-17	103	1990	0.0637	2.4	1.0100	4.5	0.1156	2.8	739	50	739	18	739	50	3.5
TS-17	82	2002	0.0651	0.9	1.1160	3.0	0.1249	1.5	778.4	19	781.8	10	778.4	19	2.3
TS-17	29	2446	0.0667	3.3	1.2170	5.9	0.1315	4.0	821	70	826	29	821	70	2.7
TS-17	98	1842	0.0692	2.7	1.4660	3.5	0.1564	2.6	896	58	979	25	896	58	-1.9
TS-17	67	3191	0.0713	5.6	1.4900	5.8	0.1497	2.5	954	98	936	21	954	98	3.6
TS-17	79	37100	0.0635	2.8	2.4130	3.1	0.2162	1.5	1200	25	1259	17	1200	25	-4.9
TS-17	47	10379	0.0717	1.5	2.9670	2.5	0.2444	1.4	1384	27	1409.6	17	1384	27	-1.8
TS-17	116	9140	0.0704	1.8	2.9610	2.5	0.2438	1.4	1385	27	1405.8	18	1385	27	-1.5
TS-17	54	9717	0.0714	1.7	2.8500	3.2	0.2361	1.7	1395	34	1366.2	19	1395	34	2.1
TS-17	85	76333	0.0739	1.4	3.0020	2.6	0.2447	1.4	1398.6	27	1411	18	1398.6	27	-0.9
TS-17	41	88000	0.0714	1.2	2.9650	2.5	0.2420	1.4	1404.9	25	1397	18	1404.9	25	0.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-17	74	147000	0.0891	1.7	3.0090	2.6	0.2460	1.4	1406	32	1417.2	18	1406	32	-0.2
TS-17	31	3800	0.0718	2.2	3.0060	2.7	0.2426	1.5	1413	25	1399.6	19	1413	25	0.9
TS-17	44	1475	0.0895	2.0	3.0080	3.1	0.2442	1.6	1423	40	1410.8	19	1423	40	1.1
TS-17	52	3468	0.0914	7.9	3.1100	8.4	0.2400	5.4	1427	160	1389	67	1427	160	2.6
TS-17	96	677	0.0910	3.6	3.1600	4.4	0.2544	1.6	1452	71	1463	25	1452	71	-0.3
TS-17	119	5690	0.0915	4.0	3.0790	5.2	0.2436	2.0	1459	76	1426	23	1459	76	2.4
TS-17	94	2795	0.0955	3.1	3.0480	4.3	0.2332	1.8	1534	59	1362.7	19	1534	59	7.4
TS-17	117	3931	0.0968	8.4	3.1300	6.7	0.2329	4.2	1550	150	1354	49	1550	150	8.6
TS-17	108	18322	0.1018	1.6	4.1060	2.4	0.2915	1.4	1658	30	1646	21	1658	30	0.2
TS-17	86	6160	0.1019	1.4	4.1880	2.4	0.3000	1.4	1659	26	1691.2	20	1659	26	-0.9
TS-17	27	25630	0.1020	1.5	4.1940	2.4	0.2977	1.4	1659	28	1678.5	21	1659	28	-0.8
TS-17	4	11496	0.1019	1.4	4.1580	2.4	0.2968	1.3	1659.4	26	1675.1	20	1659.4	26	-0.4
TS-17	102	7541	0.0841	2.1	4.1630	2.4	0.2956	1.4	1665.9	24	1669.5	20	1665.9	24	-0.2
TS-17	115	2721	0.0812	1.8	4.0880	2.7	0.2912	1.4	1666.5	23	1646.4	21	1666.5	23	1.2
TS-17	72	9131	0.0890	1.9	4.2610	2.6	0.3026	1.4	1667	26	1704.9	21	1667	26	-2.3
TS-17	93	16357	0.0887	2.0	4.3650	2.7	0.3104	1.4	1669.5	23	1743.4	22	1669.5	23	-4.4
TS-17	110	3690	0.1026	1.5	4.1890	2.4	0.2979	1.5	1670	28	1679	22	1670	28	-0.1
TS-17	112	7463	0.1025	1.5	4.1940	2.6	0.2959	1.4	1670	27	1672	22	1670	27	-0.2
TS-17	101	48405	0.0843	1.9	4.0930	2.9	0.2912	1.6	1671	27	1649	23	1671	27	1.3
TS-17	99	103500	0.0867	1.1	4.2080	2.3	0.2980	1.4	1671.2	24	1682.2	20	1671.2	24	-0.7
TS-17	77	3316	0.1024	2.4	3.7900	3.4	0.2704	2.5	1672	46	1545	32	1672	46	4.8
TS-17	104	19683	0.1027	1.5	4.2750	2.6	0.3012	1.4	1672.9	27	1698.6	21	1672.9	27	-1.0
TS-17	43	28498	0.1026	1.5	4.1910	2.6	0.2969	1.4	1673	28	1675.6	21	1673	28	0.0
TS-17	97	124340	0.1030	0.9	4.2150	2.4	0.2971	1.3	1678.6	17	1677	20	1678.6	17	0.1
TS-17	32	18314	0.1031	1.5	4.2320	2.4	0.2991	1.4	1679	27	1686.2	20	1679	27	-0.3
TS-17	15	19842	0.1030	1.4	4.0660	2.5	0.2864	1.4	1679	25	1623.2	20	1679	25	1.8
TS-17	113	4635	0.1031	1.5	4.0770	2.5	0.2888	1.5	1679.4	27	1635.4	21	1679.4	27	1.8
TS-17	81	9400	0.0938	1.8	4.4610	2.7	0.3139	1.4	1679.6	28	1759.9	21	1679.6	28	-4.8
TS-17	75	17408	0.1031	1.4	3.9240	2.4	0.2775	1.4	1680.5	26	1578.9	19	1680.5	26	3.7
TS-17	1	18131	0.1032	2.0	3.8800	3.6	0.2736	2.1	1682	38	1561	28	1682	38	4.5
TS-17	58	32183	0.1032	1.7	3.8920	2.6	0.2748	1.6	1682	33	1565	22	1682	33	4.0
TS-17	107	5572	0.1032	1.4	4.3460	2.8	0.3055	1.4	1682.4	26	1718.2	21	1682.4	26	-1.1
TS-17	59	4002	0.1031	1.8	3.7550	2.5	0.2670	1.5	1683	32	1527.6	19	1683	32	6.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-17	24	7044	0.1032	1.6	4.0440	2.4	0.2856	1.4	1683	30	1618.9	20	1683	30	2.3
TS-17	19	13420	0.0860	2.3	4.2780	3.3	0.2975	1.6	1683	28	1676	23	1683	28	0.4
TS-17	64	2429	0.1035	1.9	3.7080	3.8	0.2643	2.0	1685	36	1514	25	1685	36	6.6
TS-17	80	8295	0.1034	1.5	4.1770	2.4	0.2934	1.4	1685	28	1659.6	20	1685	28	0.9
TS-17	12	5250	0.1034	1.5	4.1150	3.4	0.2904	1.9	1685.2	27	1644	27	1685.2	27	1.6
TS-17	48	8656	0.1034	1.6	4.4800	2.7	0.3142	1.5	1685.5	37	1764.1	22	1685.5	37	-2.5
TS-17	105	71165	0.1035	1.5	4.2850	2.6	0.3007	1.4	1686	29	1696.4	21	1686	29	-0.2
TS-17	11	4705	0.1036	1.6	3.7990	2.5	0.2689	1.5	1688	31	1537.6	19	1688	31	5.7
TS-17	39	5030	0.1035	1.5	4.1390	2.4	0.2902	1.5	1688	28	1644.1	21	1688	28	1.5
TS-17	36	9000	0.1037	1.5	4.1900	2.4	0.2933	1.4	1689.8	28	1657.2	21	1689.8	28	1.1
TS-17	114	3689	0.0872	2.3	4.2300	2.6	0.2970	1.5	1691	24	1675.8	21	1691	24	0.9
TS-17	120	9070	0.1038	1.9	3.9610	3.0	0.2766	1.5	1692	35	1575	21	1692	35	3.9
TS-17	56	88450	0.1038	1.5	4.0810	2.9	0.2852	1.7	1692.4	29	1616	23	1692.4	29	2.5
TS-17	87	40522	0.1039	1.5	4.1130	2.4	0.2876	1.4	1693.9	28	1629.6	20	1693.9	28	2.2
TS-17	5	36200	0.1041	2.0	3.7910	2.6	0.2658	1.4	1697	37	1519.4	19	1697	37	6.2
TS-17	69	1425	0.0852	2.1	4.3200	3.2	0.2980	1.7	1699	31	1682	23	1699	31	1.0
TS-17	20	6733	0.1043	1.7	3.9110	3.6	0.2755	1.6	1699	32	1574	21	1699	32	5.0
TS-17	92	4757	0.1042	1.7	4.1530	2.9	0.2906	1.5	1700	32	1644	21	1700	32	2.1
TS-17	55	2360	0.1043	1.6	4.1470	2.9	0.2902	1.5	1701	29	1642	21	1701	29	2.2
TS-17	46	11280	0.1043	1.3	4.1230	2.4	0.2882	1.6	1701	26	1632	23	1701	26	2.5
TS-17	8	417	0.1046	4.0	4.3600	4.8	0.3026	2.1	1702	76	1714	26	1702	76	-0.4
TS-17	109	18600	0.0868	1.4	4.3300	2.5	0.3024	1.4	1702.1	26	1703.6	21	1702.1	26	-0.1
TS-17	61	1129	0.0858	2.7	4.1100	4.1	0.2947	2.1	1713	33	1662	27	1713	33	3.0
TS-17	89	4112	0.1050	1.6	4.2720	2.6	0.2957	1.4	1714	26	1669.3	20	1714	26	1.5
TS-17	16	2028	0.1052	1.7	4.5180	2.9	0.3125	1.6	1718	35	1750	23	1718	35	-1.0
TS-17	30	12492	0.1057	1.7	4.2840	2.6	0.2942	1.4	1726.8	31	1662.4	21	1726.8	31	2.1
TS-17	111	1997	0.1058	1.7	4.0820	2.4	0.2819	1.7	1728	31	1603	25	1728	31	4.4
TS-17	3	8095	0.1060	1.5	4.3340	2.8	0.2975	1.4	1732.6	27	1678.6	21	1732.6	27	1.9
TS-17	66	27950	0.1061	1.5	4.5350	2.6	0.3105	1.4	1733	28	1743	22	1733	28	-0.2
TS-17	100	78400	0.1060	1.8	4.5040	2.9	0.3100	1.5	1733	32	1740.1	22	1733	32	0.1
TS-17	26	2099	0.1072	2.3	4.4890	3.6	0.3021	2.1	1755	40	1702	31	1755	40	1.7
TS-17	38	12038	0.1087	1.2	4.7400	2.5	0.3146	1.5	1777.9	22	1763	22	1777.9	22	0.2
TS-17	28	2378	0.1103	2.4	4.0870	3.9	0.2696	1.7	1805	45	1541	22	1805	45	8.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-17	18	44580	0.0978	2.5	5.4010	2.8	0.3405	1.6	1875	26	1888	24	1875	26	-0.7
TS-18	89	780	0.0509	0.6	0.1493	2.3	0.0225	5.8	214	15	145.3	5.2	145.3	5.2	32.9
TS-18	24	244	0.0465	0.7	0.1527	3.2	0.0237	5.1	20	15	151.4	6.7	151.4	6.7	-655.0
TS-18	49	99	0.0469	19.2	0.1829	71.1	0.0282	14.2	42	190	230	53	230	53	-327.4
TS-18	13	396	0.0521	4.2	0.3390	8.3	0.0463	7.3	283	100	315	23	315	23	-2.8
TS-18	36	276	0.0511	2.7	0.3534	3.4	0.0502	4.4	234	66	350.1	13	350.1	13	-35.0
TS-18	11	495	0.0541	0.9	0.4207	3.3	0.0563	3.9	376.2	19	375.2	16	375.2	16	6.2
TS-18	23	4036	0.0197	2.5	0.5000	4.4	0.0617	3.9	557	60	385.9	15	385.9	15	30.7
TS-18	35	999	0.0560	2.9	0.5370	8.2	0.0694	5.3	452	71	452	21	452	21	4.4
TS-18	27	1691	0.0568	2.1	0.5847	5.0	0.0746	4.4	485	47	485	20	485	20	4.4
TS-18	112	2895	0.0257	6.6	0.6680	4.6	0.0813	3.8	610	61	503.9	19	503.9	19	17.4
TS-18	53	275	0.0573	3.8	0.5830	9.1	0.0750	6.9	507	83	508	39	508	39	7.5
TS-18	9	2315	0.0579	5.5	0.6530	9.0	0.0817	7.1	524.6	110	524.6	35	524.6	35	3.5
TS-18	43	133	0.0582	1.7	0.5680	4.6	0.0706	5.0	537	35	537	23	537	23	18.1
TS-18	76	2333	0.0612	11.1	0.8600	8.3	0.1031	5.5	643	210	652	33	643	210	1.7
TS-18	75	1766	0.0623	1.1	0.9050	3.2	0.1054	4.0	682.3	23	682.3	25	682.3	23	5.3
TS-18	51	4907	0.0631	2.4	0.9750	3.5	0.1129	3.5	711	44	707.4	29	711	44	3.0
TS-18	113	2051	0.0638	5.0	0.9980	7.1	0.1135	4.8	733	100	733	31	733	100	5.5
TS-18	12	3673	0.0643	2.3	1.0540	4.2	0.1188	3.9	752.4	47	752.4	27	752.4	47	3.8
TS-18	56	11617	0.0647	3.4	1.0940	3.7	0.1232	4.1	765	70	750.1	27	765	70	2.1
TS-18	77	2084	0.0659	18.2	1.1700	9.4	0.1270	7.7	785	390	799	59	785	390	1.5
TS-18	101	2043	0.0663	3.8	1.1840	5.2	0.1281	4.8	815	78	815	35	815	78	4.8
TS-18	34	4552	0.0710	4.1	1.5020	6.4	0.1528	5.0	957	81	957	45	957	81	4.3
TS-18	68	1452	0.0724	4.0	1.6340	6.7	0.1617	4.5	996	75	1002	43	996	75	3.0
TS-18	78	26750	0.0514	3.1	1.7000	3.9	0.1675	3.9	1026	53	998.5	36	1026	53	2.7
TS-18	3	1251	0.0532	5.5	1.8180	4.8	0.1771	3.9	1064	59	1051	39	1064	59	1.2
TS-18	41	2123	0.0756	7.1	1.8400	7.1	0.1793	6.1	1080	170	1098	63	1080	170	1.7
TS-18	69	17670	0.0798	4.5	2.3740	4.6	0.2124	4.0	1192	95	1241	43	1192	95	-4.1
TS-18	19	2423	0.0821	15.8	2.3090	11.7	0.2040	4.9	1241	270	1230	48	1241	270	3.6
TS-18	73	650	0.0723	5.0	2.8900	4.5	0.2340	4.0	1377	60	1358	48	1377	60	1.4
TS-18	110	1122	0.0718	3.2	2.9810	4.0	0.2436	3.9	1380	57	1407	49	1380	57	-2.0
TS-18	48	4298	0.0713	3.4	2.9400	4.1	0.2465	3.9	1384	48	1420	49	1384	48	-2.6
TS-18	17	26350	0.0731	1.6	3.0220	3.6	0.2481	3.7	1390	53	1428.6	48	1390	53	-2.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-18	32	5613	0.0719	1.9	2.9760	3.7	0.2470	3.8	1391	48	1422.6	49	1391	48	-2.3
TS-18	59	5837	0.0711	1.4	2.9100	3.8	0.2389	3.7	1393	60	1380.9	46	1393	60	0.9
TS-18	10	14797	0.0882	3.7	3.0140	4.6	0.2467	4.1	1398	78	1419.4	48	1398	78	-1.6
TS-18	115	3604	0.0890	3.0	2.8600	3.8	0.2376	3.8	1401	57	1374.1	47	1401	57	1.9
TS-18	2	11267	0.0720	2.5	2.9780	4.0	0.2440	3.8	1407	46	1407	49	1407	46	0.0
TS-18	58	14938	0.0716	1.1	2.9480	3.7	0.2423	3.8	1409.8	46	1399.6	47	1409.8	46	0.7
TS-18	29	20264	0.0715	1.5	3.0030	3.7	0.2443	3.8	1410	43	1408.8	47	1410	43	0.1
TS-18	46	4200	0.0717	3.5	2.9960	4.0	0.2444	3.9	1413	60	1409	48	1413	60	0.3
TS-18	87	9157	0.0716	2.2	2.9870	3.7	0.2411	3.7	1418	43	1392.3	47	1418	43	1.8
TS-18	65	829	0.1020	5.2	4.1300	7.7	0.2974	4.7	1652	97	1683	59	1652	97	-1.8
TS-18	47	19800	0.1016	3.2	4.2690	4.0	0.3033	3.6	1657	56	1709	57	1657	56	-3.1
TS-18	111	5705	0.0869	2.9	4.1480	4.1	0.2969	3.7	1659	46	1676	56	1659	46	-1.0
TS-18	109	58300	0.0880	3.1	4.2210	3.8	0.3023	3.6	1662	51	1702	57	1662	51	-2.4
TS-18	72	3626	0.0822	2.1	4.0930	3.7	0.2881	3.8	1663	51	1635	55	1663	51	1.7
TS-18	102	5276	0.0848	2.0	4.2130	3.6	0.3005	3.7	1664	49	1694	56	1664	49	-1.8
TS-18	60	6779	0.1024	2.9	3.9840	3.8	0.2821	3.9	1667.6	53	1601.7	53	1667.6	53	3.9
TS-18	119	43125	0.0864	2.3	4.0540	3.7	0.2890	3.8	1669	57	1636	55	1669	57	2.0
TS-18	28	2775	0.0843	2.4	4.1970	3.8	0.2960	3.7	1676	45	1671	57	1676	45	0.3
TS-18	93	3284	0.1027	3.6	4.1380	3.9	0.2936	3.7	1676	70	1659	55	1676	70	1.0
TS-18	116	1156	0.1032	3.2	4.3020	4.0	0.3031	4.0	1680	63	1701	57	1680	63	-1.5
TS-18	6	4757	0.1031	2.5	4.2310	3.5	0.2967	4.0	1680	47	1675.3	55	1680	47	0.3
TS-18	94	1189	0.0826	3.0	4.1400	3.9	0.2907	3.8	1682	56	1645	56	1682	56	2.2
TS-18	90	1181	0.0876	4.0	4.2500	4.0	0.2957	3.7	1684	48	1669	56	1684	48	0.9
TS-18	61	5015	0.1027	4.1	4.2480	4.7	0.2992	4.3	1686	89	1685	56	1686	89	-0.1
TS-18	14	6867	0.0891	2.4	4.2850	4.0	0.2986	3.7	1687	49	1686	57	1687	49	0.1
TS-18	26	3106	0.0847	1.9	4.2150	3.8	0.2951	3.7	1688	48	1667	55	1688	48	1.2
TS-18	5	3646	0.0895	3.7	4.3630	3.9	0.3072	3.9	1689	46	1727	58	1689	46	-2.2
TS-18	8	19600	0.0876	3.3	4.2820	4.0	0.3001	3.7	1694	48	1693	55	1694	48	0.1
TS-18	54	5471	0.1035	3.7	4.4180	4.8	0.3074	3.9	1697	65	1731	58	1697	65	-1.8
TS-18	91	7880	0.1042	3.5	4.4290	4.1	0.3102	3.9	1698	65	1740	58	1698	65	-2.6
TS-18	42	11800	0.1041	2.8	4.0310	4.2	0.2858	3.8	1698	50	1620.3	53	1698	50	4.6
TS-18	33	3907	0.1042	3.6	4.2490	4.2	0.2996	4.0	1699	64	1690	57	1699	64	0.6
TS-18	44	350000	0.1040	3.3	4.2670	4.0	0.2981	4.0	1699	62	1679	56	1699	62	1.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-18	106	1919	0.0871	2.9	4.2470	3.8	0.2960	3.7	1700	51	1671	56	1700	51	1.7
TS-18	71	8075	0.1043	5.9	4.3450	5.3	0.2986	4.0	1700	110	1682	58	1700	110	0.9
TS-18	107	10273	0.0869	2.6	4.5530	3.7	0.3181	3.8	1703	44	1780	59	1703	44	-4.5
TS-18	7	3829	0.0942	2.9	4.4300	3.8	0.3056	3.9	1706	53	1719	57	1706	53	-0.8
TS-18	40	350000	0.1052	5.5	4.4100	6.6	0.3076	4.9	1707	100	1732	61	1707	100	-1.2
TS-18	4	8118	0.0908	3.3	4.4840	3.8	0.3098	3.9	1713	45	1739	57	1713	45	-1.5
TS-18	105	6429	0.1050	3.5	4.1400	4.6	0.2868	3.8	1715	64	1625	55	1715	64	5.2
TS-18	74	13800	0.0858	2.7	4.2470	3.8	0.2922	3.8	1717	52	1652	54	1717	52	3.8
TS-18	25	21040	0.1054	2.8	4.5500	3.5	0.3080	3.9	1721	49	1731	56	1721	49	-0.6
TS-18	99	37440	0.1056	3.2	4.1640	4.1	0.2891	3.8	1722	61	1638	54	1722	61	4.9
TS-18	83	27050	0.0874	3.8	4.2500	4.9	0.2939	4.8	1723	49	1661	74	1723	49	3.6
TS-18	50	68980	0.0854	2.8	4.3050	3.7	0.3003	3.7	1725	47	1693	56	1725	47	1.9
TS-18	103	3832	0.0909	3.9	4.3240	3.7	0.2979	3.7	1727	49	1681	56	1727	49	2.7
TS-18	15	4667	0.1058	3.3	4.5590	3.7	0.3151	3.8	1727	62	1766	58	1727	62	-2.2
TS-18	84	12175	0.1045	4.5	4.3800	4.3	0.3047	4.3	1727	86	1722	55	1727	86	0.6
TS-18	81	4271	0.1059	3.4	4.3310	3.7	0.3007	3.7	1730	64	1695	57	1730	64	2.0
TS-18	100	10154	0.1061	4.7	4.4900	4.7	0.3099	4.2	1732	110	1739	66	1732	110	-0.5
TS-18	114	3728	0.1060	4.3	4.3200	5.3	0.2988	4.4	1734	78	1683	57	1734	78	2.8
TS-18	97	321	0.0876	4.1	4.2700	4.9	0.2939	4.1	1737	61	1660	59	1737	61	4.4
TS-18	80	1026	0.1066	4.8	4.4800	5.4	0.3027	4.3	1743	92	1714	58	1743	92	2.2
TS-18	98	8050	0.1067	2.6	4.8850	4.1	0.3302	3.6	1743.8	49	1841	60	1743.8	49	-5.5
TS-18	1	21200	0.0967	3.2	4.5130	3.8	0.3084	3.9	1749	58	1733	57	1749	58	0.9
TS-18	22	6067	0.1076	2.9	4.9340	4.1	0.3341	3.9	1759	54	1857	61	1759	54	-5.6
TS-18	62	350000	0.1081	2.6	4.4280	4.1	0.2985	4.0	1769	47	1685	56	1769	47	4.8
TS-18	31	52600	0.1086	2.9	4.6950	3.6	0.3132	3.8	1775	53	1756.2	57	1775	53	1.1
TS-18	38	13330	0.1104	3.2	4.6510	3.7	0.3074	3.9	1809	60	1728	57	1809	60	4.5
TS-18	45	97	0.1114	6.1	4.5100	7.5	0.2950	6.1	1810	110	1842	68	1810	110	7.6
TS-18	88	5048	0.1118	3.7	4.7320	4.6	0.3102	4.2	1834	68	1743	58	1834	68	5.1
TS-18	39	9443	0.1171	2.2	5.4580	4.2	0.3365	3.9	1915	39	1872	61	1915	39	2.3
TS-20	9	1773	0.0040	6.0	0.0833	4.1	0.0126	1.7	211	38	80.9	1.4	80.9	1.4	61.7
TS-20	79	684	0.0467	0.6	0.0817	1.2	0.0127	1.3	31	13	81.28	1	81.28	1	-162.7
TS-20	78	2600	0.0469	0.7	0.0815	1.6	0.0127	1.6	37	16	81.6	1.2	81.6	1.2	-118.9
TS-20	94	622	0.0470	1.0	0.0820	2.2	0.0128	2.2	47	22	82.2	1.6	82.2	1.6	-74.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-20	107	739	0.0042	5.0	0.0824	4.9	0.0130	1.8	294	54	83.5	1.4	83.5	1.4	71.6
TS-20	12	1168	0.0470	0.9	0.0837	1.1	0.0130	1.2	46	18	83.52	0.86	83.52	0.86	-80.9
TS-20	44	778	0.0463	0.4	0.0834	2.3	0.0130	2.3	13.2	9.2	83.6	1.8	83.6	1.8	-531.8
TS-20	17	1804	0.0470	0.9	0.0843	1.7	0.0132	1.5	45	19	84.5	1.2	84.5	1.2	-87.6
TS-20	108	2263	0.0477	1.1	0.0964	1.6	0.0148	1.4	78	24	94.6	1.2	94.6	1.2	-21.0
TS-20	53	250	0.0470	1.1	0.0946	1.9	0.0148	1.8	39	21	94.9	1.6	94.9	1.6	-142.6
TS-20	106	1410	0.0047	2.8	0.1014	4.1	0.0152	1.5	306	39	97.3	1.4	97.3	1.4	68.2
TS-20	15	970	0.0466	0.6	0.0982	1.8	0.0153	1.7	26	14	97.9	1.5	97.9	1.5	-275.4
TS-20	101	815	0.0468	0.6	0.1009	1.6	0.0157	1.5	31	13	100.2	1.3	100.2	1.3	-223.9
TS-20	19	596	0.0481	1.3	0.1506	1.6	0.0229	1.3	102	31	146.7	1.7	146.7	1.7	-43.1
TS-20	91	850	0.0466	0.6	0.1493	1.5	0.0229	1.4	26	13	146.7	1.9	146.7	1.9	-462.3
TS-20	24	2565	0.0075	3.3	0.1554	5.2	0.0230	1.7	336	48	146.7	2.5	146.7	2.5	56.3
TS-20	98	258	0.0465	0.5	0.1501	2.3	0.0233	2.3	22	10	149.2	3.2	149.2	3.2	-575.5
TS-20	116	558	0.0472	1.1	0.1546	2.1	0.0237	2.1	52	23	150.8	3.1	150.8	3.1	-189.8
TS-20	111	4860	0.0076	3.4	0.1784	5.2	0.0248	1.8	429	51	157.7	2.8	157.7	2.8	63.2
TS-20	42	428	0.0464	0.5	0.1491	1.5	0.0233	1.6	19	10	158	2.2	158	2.2	-681.1
TS-20	68	707	0.0473	1.0	0.1666	1.3	0.0256	1.3	59	22	163	1.8	163	1.8	-175.9
TS-20	22	4110	0.0488	1.6	0.2325	2.0	0.0352	1.6	132	37	223.9	3.3	223.9	3.3	-68.9
TS-20	75	1779	0.0501	1.4	0.2416	1.5	0.0354	0.8	195	31	225.6	1.7	225.6	1.7	-14.9
TS-20	13	864	0.0497	1.2	0.2502	1.5	0.0367	1.0	175	27	232.5	2.3	232.5	2.3	-32.7
TS-20	41	19460	0.0495	1.4	0.2571	1.7	0.0377	1.2	168	33	239.1	2.5	239.1	2.5	-42.1
TS-20	103	1107	0.0486	1.1	0.2570	1.7	0.0380	1.3	122	26	241.3	2.8	241.3	2.8	-97.0
TS-20	10	4073	0.0497	1.3	0.2770	1.5	0.0406	1.0	179	31	256.6	2.4	256.6	2.4	-43.1
TS-20	113	1334	0.0515	1.2	0.3200	6.3	0.0447	5.1	258	29	298	15	298	15	-8.9
TS-20	28	43	0.0484	1.7	0.2057	4.2	0.0305	3.6	113	38	325.2	7.4	325.2	7.4	-71.6
TS-20	87	163	0.0499	1.3	0.3069	1.8	0.0448	1.0	181	31	331	3.2	331	3.2	-56.1
TS-20	59	10145	0.0538	0.7	0.3903	1.0	0.0531	0.8	361	15	333.4	2.7	333.4	2.7	7.7
TS-20	52	1137	0.0547	0.3	0.4510	2.4	0.0597	2.2	399.8	8.3	396.4	7.9	396.4	7.9	6.5
TS-20	6	350000	0.0531	1.8	0.4817	1.8	0.0654	1.2	326	41	412.2	4.4	412.2	4.4	-25.3
TS-20	71	1606	0.0556	0.6	0.5040	3.8	0.0658	3.2	433	13	433	13	433	13	5.3
TS-20	69	4141	0.0676	0.4	1.2570	1.8	0.1347	1.4	854.7	9	854.7	10	854.7	9	4.7
TS-20	95	22507	0.0677	0.3	1.2740	1.0	0.1366	1.0	857.9	6	857.9	7.7	857.9	6	3.8
TS-20	39	11943	0.0703	1.1	1.4750	1.3	0.1535	0.8	931	22	920.6	6.9	931	22	1.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-20	30	928	0.0742	2.7	1.8230	3.3	0.1788	1.7	1038	54	1068	15	1038	54	-2.1
TS-20	114	3312	0.0744	1.6	1.8780	2.1	0.1846	1.1	1049	33	1091.5	10	1049	33	-4.1
TS-20	55	3359	0.0752	1.3	1.8660	1.6	0.1800	1.0	1071	28	1068.3	9.2	1071	28	0.4
TS-20	35	299	0.0749	2.7	1.8830	4.4	0.1888	3.1	1080	53	1115	27	1080	53	-3.3
TS-20	36	4485	0.0757	1.8	1.9040	2.0	0.1829	1.3	1080	38	1086	12	1080	38	-0.2
TS-20	119	3866	0.0769	1.8	2.0220	2.2	0.1897	1.2	1126	39	1119.9	10	1126	39	0.6
TS-20	5	8869	0.0775	0.7	2.0370	1.0	0.1906	0.9	1134	13	1125.3	8.9	1134	13	0.8
TS-20	97	1786	0.0810	1.4	2.1700	1.6	0.1983	1.1	1218	25	1168.6	10	1218	25	4.3
TS-20	46	350000	0.0855	1.9	2.6080	2.5	0.2245	1.2	1330	41	1303	13	1330	41	1.9
TS-20	112	435	0.0872	4.1	2.6700	4.9	0.2302	1.3	1345	80	1391	14	1345	80	0.7
TS-20	1	6490	0.0872	2.6	2.8760	3.4	0.2392	1.8	1356	53	1384	21	1356	53	-1.9
TS-20	92	22700	0.0679	1.9	2.8760	1.4	0.2393	0.9	1377	16	1383.1	11	1377	16	-0.4
TS-20	65	11980	0.0719	1.9	2.9720	1.5	0.2437	1.1	1392	19	1405	14	1392	19	-0.9
TS-20	83	22200	0.0740	2.0	2.9760	1.4	0.2442	1.6	1400.5	5.4	1408	20	1400.5	5.4	-0.5
TS-20	76	3462	0.0693	2.2	2.9040	1.4	0.2390	1.0	1409	16	1381.4	12	1409	16	2.0
TS-20	115	32547	0.0893	0.7	2.9990	1.0	0.2430	0.9	1410	13	1403.4	11	1410	13	0.5
TS-20	110	6483	0.0893	1.1	3.1200	1.6	0.2518	1.0	1413	21	1443.8	12	1413	21	-2.3
TS-20	61	66329	0.0894	0.3	3.0210	1.1	0.2468	1.3	1413.8	6.8	1426	17	1413.8	6.8	-0.5
TS-20	64	1219	0.0897	2.1	3.0330	2.3	0.2438	1.1	1416	42	1406	14	1416	42	0.7
TS-20	117	4563	0.0896	1.0	2.9490	1.3	0.2417	1.1	1417	20	1393	14	1417	20	1.6
TS-20	25	4031	0.0733	1.9	3.0900	1.4	0.2474	1.0	1420	15	1424.8	12	1420	15	-0.3
TS-20	72	6499	0.0725	2.1	3.0560	1.3	0.2482	0.9	1421	15	1429.3	12	1421	15	-0.6
TS-20	18	8906	0.0899	0.6	2.8580	0.9	0.2321	0.8	1423	11	1345.4	9.2	1423	11	5.5
TS-20	38	18100	0.0710	1.8	3.0500	1.0	0.2441	0.7	1439.1	9	1407.8	9.3	1439.1	9	2.2
TS-20	104	350000	0.0927	0.9	3.2720	1.2	0.2552	0.9	1481	17	1466.1	12	1481	17	1.1
TS-20	50	38200	0.0867	3.0	4.1750	1.4	0.2999	1.0	1659	17	1691	15	1659	17	-1.9
TS-20	63	7986	0.1020	1.6	4.2260	2.0	0.3019	1.1	1662	30	1700	15	1662	30	-2.3
TS-20	86	2363	0.0852	2.0	4.2450	1.6	0.3002	1.1	1667	17	1692	16	1667	17	-1.5
TS-20	84	7289	0.0847	1.4	4.1590	0.9	0.2947	0.8	1668.7	8.4	1665.1	12	1668.7	8.4	0.2
TS-20	100	7450	0.1027	0.6	4.2120	0.9	0.2971	0.7	1673	10	1675.8	11	1673	10	-0.2
TS-20	74	61800	0.1027	0.4	4.2370	0.8	0.2981	0.9	1673.1	6.7	1681.9	13	1673.1	6.7	-0.5
TS-20	120	176500	0.0866	1.5	4.2310	0.7	0.2990	0.8	1673.2	5.1	1686.1	12	1673.2	5.1	-0.8
TS-20	31	20886	0.1027	0.4	4.2170	0.8	0.2985	0.8	1673.7	7.2	1683.4	11	1673.7	7.2	-0.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-20	14	1159	0.1040	3.5	4.1200	4.6	0.2895	1.6	1674	65	1642	20	1674	65	2.2
TS-20	26	987	0.1031	1.5	4.2110	2.3	0.2986	1.4	1676	26	1685	19	1676	26	-0.5
TS-20	89	3006	0.1027	1.2	4.2150	1.8	0.2966	1.2	1676	22	1671	17	1676	22	0.1
TS-20	29	9631	0.0857	2.2	4.1230	0.8	0.2919	0.9	1677.3	8.9	1650.9	13	1677.3	8.9	1.6
TS-20	34	1459	0.1031	0.9	4.2130	1.4	0.2955	1.0	1679	17	1670	14	1679	17	0.6
TS-20	47	10275	0.0878	1.4	4.2400	1.0	0.2992	0.8	1679	12	1688.1	13	1679	12	-0.5
TS-20	77	6594	0.1031	0.5	4.1660	0.8	0.2949	0.8	1680.5	9.2	1666.1	11	1680.5	9.2	0.9
TS-20	85	6609	0.1034	0.7	4.2410	1.3	0.2969	1.0	1685	14	1676	15	1685	14	0.5
TS-20	60	4778	0.0841	2.4	4.2410	2.1	0.2982	1.1	1690	22	1682	17	1690	22	0.5
TS-20	67	81923	0.0833	0.8	4.0810	0.5	0.2867	0.7	1690.5	4.5	1624.9	9.8	1690.5	4.5	3.9
TS-20	8	1626	0.1036	1.4	4.2550	2.1	0.2960	1.4	1693	28	1674	18	1693	28	1.3
TS-20	7	3537	0.1037	1.6	4.3200	4.2	0.3014	2.7	1695	30	1685	36	1695	30	0.0
TS-20	20	8627	0.1039	1.4	4.2280	1.9	0.2953	1.2	1696	26	1667	17	1696	26	1.7
TS-20	96	27060	0.1042	0.7	4.2190	1.0	0.2950	0.9	1701	12	1666	13	1701	12	2.0
TS-20	90	12130	0.1043	0.3	4.1670	0.7	0.2906	0.7	1701.2	6	1644.8	10	1701.2	6	3.3
TS-20	58	2380	0.1044	1.1	4.2500	1.4	0.2960	1.0	1705	20	1674	15	1705	20	1.9
TS-20	27	10673	0.1053	1.1	4.2870	1.8	0.2979	1.0	1718	21	1679	15	1718	21	2.2
TS-20	118	5964	0.0870	1.5	4.3480	1.0	0.2998	0.9	1719	12	1690.3	13	1719	12	1.7
TS-20	40	109500	0.1056	0.5	4.4920	0.7	0.3103	0.8	1724.7	9	1741.2	12	1724.7	9	-1.0
TS-20	54	22283	0.0885	1.5	4.4810	0.9	0.3087	0.8	1726	10	1734.1	13	1726	10	-0.5
TS-20	16	6545	0.1060	1.1	4.3320	1.5	0.2992	1.0	1733	20	1684	13	1733	20	2.7
TS-20	105	26656	0.0887	1.2	4.5120	0.6	0.3093	0.7	1733.8	7.2	1737.1	11	1733.8	7.2	-0.2
TS-20	93	3089	0.1083	0.7	4.7620	0.9	0.3172	0.8	1770	13	1776.1	12	1770	13	-0.3
TS-20	99	13992	0.1085	0.7	4.8400	0.8	0.3213	0.8	1774	13	1795.9	13	1774	13	-1.2
TS-20	37	8006	0.0909	1.2	4.7220	0.9	0.3161	0.7	1779	9.1	1770.4	11	1779	9.1	0.5
TS-20	57	11760	0.0921	1.6	4.7750	0.7	0.3184	0.8	1779.1	9.1	1781.9	12	1779.1	9.1	-0.2
TS-20	109	3628	0.1125	0.2	4.9370	0.7	0.3191	0.8	1840.4	3.2	1785.4	13	1840.4	3.2	3.0
TS-20	23	24550	0.2014	0.9	15.0000	1.3	0.5381	1.2	2837	16	2775	26	2837	16	2.2
TS-21	47	493	0.0469	0.8	0.0966	2.3	0.0148	2.4	40	19	94.9	2.2	94.9	2.2	-137.5
TS-21	21	1109	0.0472	1.1	0.0964	1.9	0.0150	2.3	55	24	96.1	2.2	96.1	2.2	-74.4
TS-21	29	260	0.0473	1.1	0.0980	1.8	0.0152	2.5	56	22	97	2.3	97	2.3	-73.0
TS-21	19	397	0.0465	0.6	0.0966	2.6	0.0153	2.9	18	13	98.7	2.7	98.7	2.7	-443.9
TS-21	55	592	0.0463	4.1	0.0990	56.6	0.0155	2.4	181	55	99	2.4	99	2.4	45.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-21	43	1852	0.0469	1.2	0.1492	2.3	0.0229	2.4	36	25	146.4	3.3	146.4	3.3	-306.1
TS-21	71	291	0.0470	1.3	0.1474	3.3	0.0229	3.0	43	27	146.5	4	146.5	4	-239.3
TS-21	99	350000	0.0472	1.1	0.1468	2.9	0.0227	3.1	51	22	146.5	3.9	146.5	3.9	-183.7
TS-21	40	520	0.0470	0.9	0.1488	2.4	0.0230	2.7	45	19	147.5	3.6	147.5	3.6	-225.8
TS-21	56	442	0.0473	0.9	0.1512	1.9	0.0233	2.4	59	21	148.5	3.3	148.5	3.3	-151.4
TS-21	79	746	0.0470	7.0	0.1510	31.8	0.0234	2.6	345	58	149.2	3.9	149.2	3.9	56.8
TS-21	35	258	0.0480	1.5	0.1540	2.3	0.0234	2.6	94	32	149.8	3.7	149.8	3.7	-58.5
TS-21	108	80	0.0491	4.9	0.1577	3.4	0.0246	3.8	63	35	157.4	4.8	157.4	4.8	-148.4
TS-21	83	5462	0.0477	0.9	0.1736	2.0	0.0263	2.2	84	22	167.4	3.5	167.4	3.5	-99.2
TS-21	92	321	0.0478	1.2	0.2295	2.3	0.0350	2.6	84	25	221.8	5.3	221.8	5.3	-164.2
TS-21	85	349	0.0482	1.5	0.2343	2.9	0.0357	2.8	101	31	229	5.8	229	5.8	-123.9
TS-21	102	1319	0.0492	1.6	0.2467	4.1	0.0368	3.0	147	37	235.1	6.4	235.1	6.4	-58.6
TS-21	100	3523	0.0511	2.7	0.2729	40.3	0.0383	2.2	258	36	242.1	5.2	242.1	5.2	6.2
TS-21	65	343	0.0529	3.8	0.2800	14.6	0.0387	2.4	366	45	244.9	5.8	244.9	5.8	33.1
TS-21	53	2176	0.0502	3.0	0.2732	40.3	0.0402	2.4	261	30	254	5.9	254	5.9	2.7
TS-21	109	889	0.0524	0.5	0.3265	3.1	0.0452	2.4	302.4	12	302.4	7.4	302.4	7.4	5.8
TS-21	81	674	0.0552	0.7	0.4774	4.0	0.0624	2.6	420.3	15	416.9	10	416.9	10	7.1
TS-21	112	2994	0.0570	0.9	0.5930	4.0	0.0752	3.2	490	20	490	15	490	15	4.7
TS-21	18	10800	0.0721	1.8	1.6110	3.7	0.1629	2.3	988	37	975	20	988	37	1.5
TS-21	24	3001	0.0736	1.9	1.7860	3.3	0.1751	2.2	1017	39	1039	19	1017	39	-2.3
TS-21	62	191	0.0749	2.8	1.8470	4.8	0.1841	3.2	1070	58	1097	28	1070	58	-1.7
TS-21	12	5017	0.0751	1.1	1.9480	3.0	0.1873	2.0	1071	18	1106.7	21	1071	18	-3.3
TS-21	105	1567	0.0758	1.5	1.9370	3.3	0.1856	2.3	1088	30	1097.1	21	1088	30	-0.8
TS-21	8	8170	0.0761	1.6	1.8730	3.2	0.1803	2.1	1095	31	1070.6	21	1095	31	2.4
TS-21	11	43110	0.0761	1.4	1.8360	3.4	0.1786	2.1	1098	30	1062.1	20	1098	30	3.6
TS-21	52	6974	0.0798	1.3	2.1850	5.0	0.1980	2.3	1192	25	1194	23	1192	25	2.3
TS-21	20	1188	0.0800	1.6	2.1890	3.1	0.2000	2.2	1199	32	1173.3	23	1199	32	2.0
TS-21	119	841	0.0810	1.6	2.3210	2.1	0.2113	2.3	1226	32	1248	26	1226	32	-0.7
TS-21	111	2136	0.0828	1.3	2.4150	3.9	0.2115	2.3	1263	26	1270	25	1263	26	2.1
TS-21	34	756	0.0855	2.1	2.7010	4.1	0.2310	2.5	1317	42	1338	27	1317	42	-1.7
TS-21	117	390	0.0872	2.5	2.7200	4.8	0.2325	2.8	1357	50	1355	30	1357	50	0.7
TS-21	5	4604	0.0880	1.7	2.9310	2.8	0.2413	2.1	1369	25	1393	27	1369	25	-1.8
TS-21	16	25700	0.0881	0.8	2.8700	3.1	0.2384	2.0	1384.7	16	1377.8	25	1384.7	16	0.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-21	23	838	0.0882	2.7	2.8500	6.0	0.2390	3.0	1397	52	1378	31	1397	52	1.2
TS-21	67	66000	0.0888	1.1	3.0190	3.3	0.2447	2.1	1397	22	1413	26	1397	22	-1.0
TS-21	13	2574	0.0913	2.2	3.2240	1.1	0.2556	2.2	1461	29	1467	28	1461	29	-0.4
TS-21	60	1710	0.0940	6.3	3.2500	9.2	0.2500	4.8	1473	120	1443	58	1473	120	2.6
TS-21	17	45300	0.0927	1.3	3.2860	2.3	0.2563	2.3	1489	21	1470	30	1489	21	1.3
TS-21	77	821	0.0957	4.0	3.4100	8.8	0.2615	3.7	1509	80	1518	45	1509	80	0.7
TS-21	3	6219	0.0991	3.4	3.8500	6.5	0.2733	3.2	1607	67	1564	42	1607	67	3.2
TS-21	15	3180	0.1013	1.4	4.1830	0.9	0.2989	2.1	1628	19	1685	32	1628	19	-3.5
TS-21	80	2044	0.1007	2.4	4.0950	1.8	0.2886	2.4	1636	33	1634	34	1636	33	0.1
TS-21	2	4462	0.1014	1.6	4.3000	4.4	0.2978	3.4	1648	29	1679	51	1648	29	-2.1
TS-21	6	2821	0.1018	1.4	4.2340	1.6	0.3019	2.1	1653	24	1700	32	1653	24	-2.8
TS-21	45	4550	0.1020	1.4	4.2840	3.3	0.3038	2.1	1659	25	1712	31	1659	25	-3.1
TS-21	41	2069	0.1022	1.6	4.2000	3.8	0.3005	2.1	1661	28	1690	31	1661	28	-2.0
TS-21	58	350000	0.1020	1.3	4.2490	3.3	0.2995	2.0	1661	23	1695	31	1661	23	-1.7
TS-21	49	2687	0.1024	1.3	4.3910	3.4	0.3074	2.1	1667	24	1726	31	1667	24	-3.7
TS-21	48	5177	0.1026	1.0	4.1810	2.9	0.2959	2.1	1670.9	18	1670.2	30	1670.9	18	0.0
TS-21	69	8760	0.1029	1.3	4.2380	2.3	0.3014	2.2	1671	20	1698	33	1671	20	-1.6
TS-21	113	2962	0.1028	0.9	4.3860	0.9	0.3100	2.1	1673	16	1740	32	1673	16	-4.0
TS-21	31	4312	0.1031	1.3	4.3310	3.7	0.3017	2.1	1675	19	1699	31	1675	19	-1.4
TS-21	28	22864	0.1027	0.6	4.1070	0.7	0.2923	2.0	1675.4	13	1652.7	29	1675.4	13	1.4
TS-21	22	9367	0.1028	1.1	4.2290	3.5	0.3017	2.2	1676	19	1697	33	1676	19	-1.4
TS-21	75	1672	0.1028	1.1	4.4040	0.7	0.3071	2.1	1677	16	1726	32	1677	16	-2.9
TS-21	54	1140	0.1029	1.7	4.2540	4.0	0.2989	2.3	1680	33	1689	32	1680	33	-0.5
TS-21	42	15420	0.1030	1.0	4.1490	0.8	0.2934	2.1	1680	16	1661	31	1680	16	1.1
TS-21	32	1221	0.1032	1.6	4.3070	3.7	0.3015	2.3	1681	31	1694	32	1681	31	-1.0
TS-21	63	2955	0.1031	1.1	4.2950	3.3	0.2994	2.0	1681	21	1688	30	1681	21	-0.4
TS-21	10	40875	0.1030	0.8	3.9330	0.6	0.2779	2.0	1681.8	17	1581.7	28	1681.8	17	6.0
TS-21	50	6774	0.1032	1.1	4.1800	3.3	0.2961	2.1	1682	20	1671	31	1682	20	0.7
TS-21	14	4871	0.1029	1.0	4.2020	0.1	0.2976	2.1	1682.4	16	1679	31	1682.4	16	0.2
TS-21	107	6242	0.1033	1.3	4.2810	3.0	0.2998	2.1	1683	24	1690	31	1683	24	-0.4
TS-21	90	5450	0.1036	1.7	4.3030	4.2	0.2980	2.3	1684	33	1679	33	1684	33	0.2
TS-21	89	830	0.1036	2.3	4.1800	5.5	0.2970	2.6	1685	44	1676	34	1685	44	0.6
TS-21	110	1689	0.1034	1.2	4.2550	3.3	0.2988	2.1	1685	22	1685	30	1685	22	0.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-21	64	62140	0.1031	1.4	4.1490	0.2	0.2943	2.0	1687	17	1663	30	1687	17	1.4
TS-21	96	81650	0.1035	0.8	4.1370	1.4	0.2859	2.0	1693.1	14	1620.9	29	1693.1	14	4.3
TS-21	59	57130	0.1040	1.3	4.2040	3.8	0.2954	2.4	1694	23	1669	36	1694	23	1.4
TS-21	82	3025	0.1041	1.2	4.4110	3.4	0.3035	2.1	1697	23	1710	31	1697	23	-0.6
TS-21	93	17114	0.1037	0.8	4.0350	1.3	0.2821	2.5	1698	19	1601	35	1698	19	5.7
TS-21	87	6504	0.1042	1.4	4.0610	3.2	0.2819	2.1	1699	26	1601	29	1699	26	5.8
TS-21	57	5422	0.1041	2.6	4.2210	3.6	0.2909	2.3	1700	47	1643	35	1700	47	3.2
TS-21	115	5274	0.1042	1.2	4.0160	2.0	0.2786	2.1	1701	22	1584	30	1701	22	6.9
TS-21	120	761	0.1045	2.1	4.4590	4.0	0.3080	2.3	1703	39	1736	33	1703	39	-1.6
TS-21	84	8360	0.1042	2.0	4.2660	0.8	0.2927	2.2	1706	24	1654	32	1706	24	3.0
TS-21	94	101300	0.1046	1.2	4.5810	3.1	0.3109	2.1	1708	25	1745	31	1708	25	-2.2
TS-21	114	1451	0.1053	3.5	4.3200	0.8	0.3024	2.1	1710	39	1703	32	1710	39	0.4
TS-21	39	6550	0.1052	1.6	4.4450	3.8	0.3085	2.3	1717	29	1730	35	1717	29	-0.9
TS-21	1	62750	0.1052	1.3	4.3100	3.0	0.2969	2.0	1717	24	1674.7	29	1717	24	2.4
TS-21	76	74600	0.1059	1.8	4.2830	3.7	0.2906	2.2	1726	33	1644	31	1726	33	4.8
TS-21	61	3092	0.1060	0.9	4.4810	3.3	0.3071	2.1	1733.9	17	1727	32	1733.9	17	0.3
TS-21	95	5381	0.1061	1.5	4.2870	3.5	0.2924	1.9	1734	28	1653.3	29	1734	28	4.6
TS-21	27	18206	0.1060	0.9	4.4720	0.1	0.3076	2.1	1736.4	17	1729	31	1736.4	17	0.4
TS-21	86	11357	0.1081	0.6	4.6940	1.9	0.3155	2.1	1768.3	13	1770	33	1768.3	13	-0.1
TS-21	38	107500	0.1082	0.9	4.7670	1.4	0.3188	2.0	1774.6	13	1783	32	1774.6	13	-0.5
TS-21	106	2599	0.1090	1.7	4.7890	3.5	0.3192	2.1	1785	32	1784	32	1785	32	-0.1
TS-21	51	3618	0.1096	1.1	4.7010	3.2	0.3144	2.0	1792	20	1762	31	1792	20	1.7
TS-21	44	5097	0.1108	1.0	5.0080	1.5	0.3273	2.0	1813	16	1825	32	1813	16	-0.7
TS-21	72	2768	0.1122	1.3	5.1390	3.7	0.3293	2.2	1841	25	1835	33	1841	25	0.3
TS-21	74	2191	0.1345	1.8	7.1000	3.7	0.3844	2.1	2159	32	2100	38	2159	32	2.8
TS-21	91	145400	0.1785	1.2	12.7300	3.2	0.5128	2.0	2640	20	2669	44	2640	20	-1.1
TS-21	66	3845	0.1829	1.5	13.1600	3.6	0.5188	2.5	2681	26	2684	47	2681	26	-0.4
TS-22	70	687	0.0476	1.2	0.0868	2.0	0.0133	2.3	78	27	85.64	1.9	85.64	1.9	-9.3
TS-22	57	106	0.0467	0.9	0.0920	2.7	0.0143	3.1	28	20	91.9	2.7	91.9	2.7	-228.6
TS-22	12	202	0.0470	1.1	0.0920	2.3	0.0144	3.0	43	25	93.1	2.5	93.1	2.5	-114.4
TS-22	76	753	0.0442	7.0	0.0897	7.5	0.0147	3.3	407	70	94	3.1	94	3.1	76.9
TS-22	80	183	0.0466	0.7	0.0951	2.0	0.0149	2.9	26	16	96.1	2.4	96.1	2.4	-267.3
TS-22	23	634	0.0463	0.6	0.0982	2.9	0.0153	3.4	13	13	97.9	3.1	97.9	3.1	-652.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-22	116	50	0.0469	1.4	0.0979	3.7	0.0153	4.2	25	22	98.3	3.7	98.3	3.7	-291.6
TS-22	55	173	0.0464	0.7	0.0995	2.7	0.0154	3.2	15	12	99	2.9	99	2.9	-558.0
TS-22	58	2424	0.0507	7.7	0.1109	7.7	0.0161	3.5	466	75	103	3.5	103	3.5	77.9
TS-22	10	1367	0.0480	5.0	0.1061	5.7	0.0162	2.7	281	65	103.5	2.8	103.5	2.8	63.2
TS-22	87	197	0.0468	1.2	0.1061	2.9	0.0167	3.6	27	18	106.8	3.5	106.8	3.5	-294.4
TS-22	19	74	0.0463	0.3	0.0997	3.0	0.0156	3.7	13.1	7.5	110.4	3.5	110.4	3.5	-659.5
TS-22	74	2480	0.0472	1.2	0.1427	2.2	0.0220	2.7	45	23	142.5	3.5	142.5	3.5	-211.1
TS-22	2	607	0.0478	1.3	0.1510	2.1	0.0232	2.5	86	30	148.5	3.5	148.5	3.5	-72.2
TS-22	15	424	0.0477	1.4	0.1554	2.0	0.0237	2.6	80	31	151.2	3.5	151.2	3.5	-88.4
TS-22	60	1643	0.0481	2.3	0.1586	3.3	0.0240	3.5	98	53	154	5.1	154	5.1	-55.9
TS-22	63	172	0.0461	0.0	0.1363	6.6	0.0215	4.6	1.405	0.078	160.6	6.6	160.6	6.6	-9636.7
TS-22	69	157	0.0482	1.9	0.1650	22.4	0.0223	16.1	93	37	165	24	165	24	-51.6
TS-22	68	149	0.0473	4.2	0.1845	5.1	0.0289	2.7	62	100	214.6	5.2	214.6	5.2	-196.0
TS-22	66	737	0.0481	1.8	0.2204	3.0	0.0333	2.3	102	42	217.4	4.6	217.4	4.6	-107.0
TS-22	86	699	0.0480	1.4	0.2417	2.5	0.0365	2.7	94	32	232	5.8	232	5.8	-146.1
TS-22	4	266	0.0479	1.4	0.2424	2.4	0.0366	2.5	90	31	232.2	5.4	232.2	5.4	-157.2
TS-22	96	392	0.0487	1.8	0.2417	2.8	0.0365	2.7	126	40	232.8	5.6	232.8	5.6	-83.6
TS-22	71	10200	0.0494	1.7	0.2530	2.1	0.0374	2.3	159	39	238.1	5.1	238.1	5.1	-48.9
TS-22	33	1543	0.0495	1.9	0.2592	2.2	0.0385	2.4	161	43	246.7	5.3	246.7	5.3	-51.1
TS-22	43	2741	0.0496	1.6	0.2666	2.7	0.0390	2.4	173	37	247	5.5	247	5.5	-42.5
TS-22	118	297	0.0515	0.9	0.2520	6.7	0.0356	5.1	264	22	255	13	255	13	14.8
TS-22	98	500	0.0535	1.5	0.3810	6.0	0.0515	4.3	348	33	348	14	348	14	7.2
TS-22	40	340	0.0544	1.4	0.4170	9.8	0.0555	7.6	389	33	378	26	378	26	10.8
TS-22	78	438	0.0545	0.4	0.4381	2.2	0.0585	2.4	392.7	8.9	395.9	9.9	395.9	9.9	6.7
TS-22	113	562	0.0561	0.7	0.5232	3.6	0.0677	2.5	454.1	16	453.2	11	453.2	11	7.0
TS-22	41	5117	0.0586	1.7	0.6830	3.4	0.0841	2.1	539	28	521.2	11	521.2	11	3.3
TS-22	102	808	0.0620	1.6	0.8980	5.6	0.1037	3.8	674	34	674	23	674	34	5.6
TS-22	29	4429	0.0630	2.5	0.9870	4.7	0.1133	3.4	707	53	707	23	707	53	2.3
TS-22	3	1872	0.0640	1.4	1.0440	3.2	0.1183	2.2	742.6	29	742.6	15	742.6	29	3.0
TS-22	17	3239	0.0649	1.9	1.1160	4.1	0.1242	2.3	770	37	773.8	17	770	37	2.0
TS-22	45	5801	0.0651	1.5	1.1080	3.8	0.1233	2.4	776.6	33	776.6	17	776.6	33	3.5
TS-22	28	886	0.0708	6.9	1.5060	8.0	0.1505	4.2	946	130	947	35	946	130	4.5
TS-22	97	1656	0.0725	1.8	1.8020	3.1	0.1779	2.3	1005	40	1053.9	21	1005	40	-5.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-22	83	687	0.0770	1.8	1.9270	3.3	0.1841	2.2	1118	35	1091.7	22	1118	35	2.6
TS-22	18	2302	0.0780	1.8	2.0180	3.1	0.1893	2.2	1144	38	1118.3	23	1144	38	2.3
TS-22	111	17809	0.0862	1.4	2.7570	3.3	0.2315	2.3	1341	27	1342	28	1341	27	-0.1
TS-22	119	1086	0.0870	2.4	2.7870	4.3	0.2319	2.5	1355	46	1345	28	1355	46	0.8
TS-22	50	350000	0.0870	2.1	2.8790	3.0	0.2415	2.4	1357	41	1390	29	1357	41	-2.7
TS-22	112	5016	0.0869	1.8	2.9680	4.0	0.2443	2.5	1358	37	1408	29	1358	37	-3.8
TS-22	117	758	0.0877	2.4	2.9310	4.1	0.2398	2.5	1371	47	1389	29	1371	47	-1.0
TS-22	52	14125	0.0877	1.7	2.9360	3.7	0.2470	2.3	1376	35	1421	27	1376	35	-3.5
TS-22	30	4956	0.0876	1.4	3.0260	3.2	0.2503	2.2	1377	26	1440	28	1377	26	-4.6
TS-22	53	7261	0.0878	1.8	3.0060	3.7	0.2526	2.2	1378	33	1450.5	28	1378	33	-5.4
TS-22	114	3500	0.0881	1.7	3.0590	3.2	0.2474	2.3	1382	33	1423	28	1382	33	-3.1
TS-22	39	7325	0.0881	1.5	2.9310	3.1	0.2392	2.2	1383	29	1383.7	27	1383	29	-0.1
TS-22	54	4074	0.0881	1.5	2.9640	3.4	0.2488	2.3	1384	28	1430.9	27	1384	28	-3.5
TS-22	49	2707	0.0880	1.6	2.9620	3.3	0.2493	2.2	1391	28	1435	28	1391	28	-3.2
TS-22	11	1455	0.0887	2.0	2.9330	4.4	0.2402	2.5	1398	41	1388	28	1398	41	0.7
TS-22	81	6193	0.0889	1.5	2.9590	3.2	0.2434	2.1	1401	28	1404.8	27	1401	28	-0.2
TS-22	85	979	0.0894	2.6	2.9650	3.7	0.2414	2.3	1404	28	1394	29	1404	28	0.7
TS-22	27	10007	0.0894	1.1	2.8900	3.2	0.2376	2.2	1412.4	22	1374	27	1412.4	22	2.7
TS-22	79	34775	0.0895	1.3	3.0350	3.1	0.2474	2.1	1414	26	1426	28	1414	26	-0.8
TS-22	93	1735	0.0893	2.2	2.9950	4.3	0.2423	2.4	1415	46	1395	29	1415	46	1.2
TS-22	64	1391	0.0893	2.6	3.2040	3.1	0.2538	2.6	1417	48	1459	33	1417	48	-2.9
TS-22	103	534	0.0904	3.1	3.1160	4.2	0.2506	2.8	1430	63	1441	30	1430	63	-0.8
TS-22	101	799	0.0902	2.3	3.0480	3.2	0.2458	2.3	1433	44	1413	29	1433	44	1.2
TS-22	65	2369	0.0911	1.6	3.0940	3.6	0.2462	2.2	1447	32	1420.5	28	1447	32	1.9
TS-22	108	4160	0.0980	3.6	3.9900	6.0	0.2920	3.0	1581	69	1659	38	1581	69	-4.4
TS-22	47	2737	0.0994	1.6	3.9770	3.3	0.2945	2.2	1617	28	1664	32	1617	28	-2.9
TS-22	82	350000	0.1011	3.7	4.3200	5.3	0.3042	2.8	1631	74	1724	42	1631	74	-4.9
TS-22	51	2889	0.1006	2.1	3.9300	4.3	0.2878	2.8	1632	41	1629	39	1632	41	0.2
TS-22	67	1558	0.1007	1.9	4.0970	4.1	0.2926	2.3	1639	33	1653	32	1639	33	-0.9
TS-22	115	886	0.1007	2.7	4.1670	3.6	0.2974	2.4	1642	47	1678	35	1642	47	-2.2
TS-22	99	5116	0.1012	1.8	4.0660	3.4	0.2932	2.1	1644	33	1656.7	31	1644	33	-0.8
TS-22	106	5529	0.1012	1.6	4.0680	3.4	0.2917	2.2	1645	30	1649	31	1645	30	-0.3
TS-22	105	3388	0.1014	1.9	4.1900	3.6	0.3015	2.4	1650	37	1701	34	1650	37	-2.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-22	109	2198	0.1019	2.2	4.2250	4.0	0.3001	2.4	1658	41	1697	35	1658	41	-2.0
TS-22	35	9013	0.1019	1.3	4.2330	2.8	0.2989	2.1	1658.9	23	1685.9	31	1658.9	23	-1.6
TS-22	48	11412	0.1018	0.7	4.0520	3.0	0.2931	2.1	1664.1	19	1657.1	31	1664.1	19	0.4
TS-22	88	1274	0.1031	2.0	4.4140	3.4	0.3116	2.3	1681	36	1745	34	1681	36	-4.0
TS-22	61	2491	0.1033	2.1	4.2150	3.1	0.2992	2.4	1682	39	1686	36	1682	39	-0.3
TS-22	72	8915	0.1033	0.8	4.2170	3.1	0.2968	2.2	1683.2	23	1675	32	1683.2	23	0.5
TS-22	77	3075	0.1032	2.1	4.1700	3.4	0.2963	2.3	1686	30	1673	34	1686	30	0.8
TS-22	38	641	0.1042	3.6	4.1600	6.5	0.2945	3.7	1691	68	1668	40	1691	68	1.4
TS-22	92	726	0.1037	3.1	4.4100	4.3	0.3062	2.5	1691	58	1719	35	1691	58	-1.8
TS-22	46	13850	0.1037	1.4	4.2420	3.3	0.2981	2.1	1691	25	1682	31	1691	25	0.5
TS-22	37	2467	0.1038	1.3	4.3010	3.3	0.2963	2.6	1692	23	1677	35	1692	23	1.1
TS-22	75	3597	0.1043	1.2	4.3020	3.0	0.2996	2.2	1702.1	23	1686	32	1702.1	23	0.8
TS-22	89	596	0.1039	2.7	4.3000	4.4	0.2998	2.8	1705	54	1694	38	1705	54	0.5
TS-22	13	1394	0.1044	3.2	4.4900	4.2	0.3074	2.4	1705	62	1730	36	1705	62	-1.3
TS-22	16	2548	0.1044	1.7	4.4180	3.4	0.3077	2.3	1707	32	1727	34	1707	32	-1.3
TS-22	62	12190	0.1048	1.2	4.5050	3.1	0.3107	2.2	1712.6	24	1744	33	1712.6	24	-1.8
TS-22	14	9380	0.1054	1.8	4.4480	3.8	0.3069	2.4	1722	32	1721	35	1722	32	-0.2
TS-22	1	2156	0.1058	2.4	4.1890	3.8	0.2916	2.6	1725	43	1654	34	1725	43	4.4
TS-22	6	2224	0.1057	3.6	4.3500	4.8	0.3028	2.9	1740	66	1705	39	1740	66	2.0
TS-22	24	3304	0.1066	1.2	4.2830	3.5	0.2982	2.4	1740	23	1682	34	1740	23	3.3
TS-22	20	13092	0.1067	1.0	4.1670	3.1	0.2877	2.1	1743.3	20	1629.7	31	1743.3	20	6.5
TS-22	44	27000	0.1071	1.7	4.5220	3.1	0.3072	2.5	1750	31	1725	39	1750	31	1.4
TS-22	26	45590	0.1080	2.2	4.6860	3.4	0.3213	2.2	1765	25	1796	35	1765	25	-1.8
TS-22	22	5272	0.1083	1.6	4.5820	3.3	0.3087	2.3	1769.8	29	1736	35	1769.8	29	1.9
TS-22	73	5647	0.1118	1.3	5.2400	3.4	0.3402	2.1	1828.9	24	1887	35	1828.9	24	-3.2
TS-22	32	90300	0.1126	0.9	5.2300	3.1	0.3346	2.2	1850.6	19	1860	36	1850.6	19	-0.5
TS-23	7	873	0.0464	0.6	0.0865	3.0	0.0135	3.9	15.3	9.3	87	3	87	3	-462.7
TS-23	35	1214	0.0468	5.6	0.0882	6.0	0.0138	3.0	241	56	88.2	2.6	88.2	2.6	63.4
TS-23	5	151	0.0467	0.8	0.0987	1.9	0.0154	3.2	28	16	99.1	2.9	99.1	2.9	-251.4
TS-23	80	2233	0.0465	0.6	0.1023	2.1	0.0160	3.2	21	12	102.3	3	102.3	3	-386.2
TS-23	62	209	0.0458	8.3	0.1072	8.1	0.0168	3.3	477	93	107.2	3.6	107.2	3.6	77.5
TS-23	63	2253	0.0473	1.3	0.1105	2.4	0.0169	3.3	58	28	108.2	3.2	108.2	3.2	-86.4
TS-23	84	212	0.0461	0.0	0.1214	3.1	0.0191	3.1	1.547	0.17	137.6	4.2	137.6	4.2	-7779.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-23	36	279	0.0490	1.3	0.2010	8.5	0.0293	6.8	144	30	206	13	206	13	-29.2
TS-23	38	239	0.0484	1.8	0.2110	12.8	0.0316	11.4	113	41	226	25	226	25	-77.0
TS-23	119	350000	0.0488	1.9	0.2505	3.5	0.0379	4.0	129	42	242.4	8	242.4	8	-85.8
TS-23	47	167	0.0509	1.4	0.2480	12.5	0.0342	11.4	230	33	244	26	244	26	6.5
TS-23	73	314	0.0512	0.4	0.2484	4.4	0.0352	3.4	247.8	9.8	247.8	8	247.8	8	10.1
TS-23	39	355	0.0509	1.2	0.2640	9.5	0.0371	7.8	262	21	252	18	252	18	10.7
TS-23	41	344	0.0486	1.4	0.2738	2.7	0.0412	3.2	122	32	261.9	7.6	261.9	7.6	-113.3
TS-23	118	180	0.0526	0.2	0.3124	2.2	0.0430	2.8	312.7	3.8	313.2	7.9	313.2	7.9	13.2
TS-23	101	1961	0.0494	2.2	0.3560	6.2	0.0522	4.4	153	49	344	15	344	15	-114.4
TS-23	64	478	0.0548	2.6	0.5160	14.7	0.0633	12.5	381	58	418	48	418	48	-2.6
TS-23	86	1126	0.0572	1.0	0.6090	4.4	0.0768	3.8	499	22	499	18	499	18	4.4
TS-23	90	3134	0.0575	0.5	0.6273	2.9	0.0790	2.8	511.6	11	511.6	14	511.6	14	4.2
TS-23	100	2363	0.0583	0.3	0.6713	2.1	0.0834	2.5	542	6.5	542	14	542	14	4.7
TS-23	89	4000	0.0624	0.8	0.9360	3.3	0.1087	2.8	688.8	17	682.9	18	688.8	17	3.4
TS-23	49	587	0.0635	2.4	0.9800	6.8	0.1104	5.1	718	50	718	33	718	50	6.3
TS-23	111	1523	0.0643	2.6	1.0580	6.4	0.1183	4.5	746	57	746	30	746	57	3.6
TS-23	46	903	0.0671	0.5	1.2080	2.5	0.1306	2.9	838.8	10	838.8	22	838.8	10	5.6
TS-23	76	975	0.0671	1.0	1.2280	4.2	0.1321	3.5	841	22	841	26	841	22	5.0
TS-23	78	1683	0.0713	1.8	1.4990	6.1	0.1550	3.7	960	35	970	31	960	35	3.0
TS-23	99	4381	0.0744	0.8	1.7550	4.6	0.1717	2.9	1052.8	16	1056.6	26	1052.8	16	3.0
TS-23	31	4523	0.0799	5.5	2.0800	8.2	0.1880	3.2	1185	97	1144	29	1185	97	5.8
TS-23	52	3074	0.0845	2.4	2.6580	4.1	0.2289	2.9	1309	50	1330	33	1309	50	-1.5
TS-23	15	350000	0.0862	2.8	2.9020	4.8	0.2415	3.1	1347	55	1397	36	1347	55	-3.5
TS-23	13	16543	0.0865	7.4	2.6600	7.5	0.2201	3.5	1348	140	1306	39	1348	140	4.7
TS-23	59	7740	0.0869	1.6	2.9450	3.3	0.2461	2.6	1359	31	1418.5	33	1359	31	-4.3
TS-23	42	6341	0.0872	0.8	2.9470	2.9	0.2434	2.6	1363	16	1404	33	1363	16	-3.0
TS-23	25	1798	0.0868	1.7	2.8130	3.9	0.2342	2.9	1370	35	1355	33	1370	35	1.0
TS-23	30	2160	0.0874	1.7	2.7250	3.5	0.2299	2.8	1375	35	1338	32	1375	35	3.0
TS-23	23	8329	0.0879	0.8	2.8810	2.8	0.2351	2.6	1379.5	14	1361.2	31	1379.5	14	1.3
TS-23	103	1186	0.0881	1.6	2.8900	3.5	0.2359	2.9	1381	33	1364	34	1381	33	1.2
TS-23	106	3856	0.0881	1.4	2.8760	3.3	0.2391	2.8	1382	23	1382	35	1382	23	0.0
TS-23	22	8057	0.0881	1.0	2.8290	3.2	0.2347	2.6	1384	18	1359.9	32	1384	18	1.8
TS-23	57	9404	0.0882	0.8	2.9250	2.9	0.2434	2.5	1385.8	16	1404.6	32	1385.8	16	-1.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-23	48	10809	0.0882	0.9	3.0960	2.5	0.2525	2.5	1386	17	1450.6	33	1386	17	-4.7
TS-23	67	47900	0.0882	0.9	2.9520	2.9	0.2491	2.6	1386	18	1433.6	33	1386	18	-3.4
TS-23	40	54900	0.0884	0.9	2.9390	2.9	0.2419	2.6	1386	17	1396.3	32	1386	17	-0.7
TS-23	50	2061	0.0880	1.4	2.9880	2.9	0.2446	2.7	1387	28	1410	34	1387	28	-1.7
TS-23	18	204000	0.0880	0.7	2.9170	3.0	0.2399	2.7	1388	14	1386	33	1388	14	0.1
TS-23	28	9200	0.0885	0.9	2.7970	3.3	0.2328	2.6	1391	16	1348.3	31	1391	16	3.0
TS-23	16	19300	0.0885	1.0	2.9810	3.0	0.2442	2.6	1391	19	1406.6	32	1391	19	-1.3
TS-23	11	129200	0.0885	0.9	2.8090	3.1	0.2294	2.6	1393.3	17	1331.5	31	1393.3	17	4.4
TS-23	117	8863	0.0886	1.1	2.9730	2.9	0.2457	2.5	1395	16	1417.3	32	1395	16	-1.6
TS-23	61	16600	0.0891	1.5	2.9430	3.2	0.2450	2.6	1395	21	1413.6	34	1395	21	-1.3
TS-23	2	3549	0.0879	2.2	2.9950	3.7	0.2467	2.7	1396	41	1420	33	1396	41	-1.8
TS-23	72	2425	0.0887	1.4	3.1250	3.5	0.2585	2.6	1398	28	1482.4	34	1398	28	-6.0
TS-23	91	4067	0.0886	1.7	3.1220	3.5	0.2529	2.6	1398	34	1455	35	1398	34	-3.9
TS-23	74	2381	0.0888	1.6	3.0370	3.6	0.2496	2.9	1400	32	1434	34	1400	32	-2.6
TS-23	109	4477	0.0888	1.5	2.8520	4.2	0.2382	2.6	1400	27	1376	33	1400	27	1.6
TS-23	98	15017	0.0884	1.0	3.0470	3.0	0.2458	2.6	1400	15	1416.5	33	1400	15	-1.2
TS-23	105	890	0.0888	1.7	2.8260	3.9	0.2333	2.8	1402	36	1353	33	1402	36	3.6
TS-23	94	12063	0.0890	0.8	2.9770	2.9	0.2394	2.6	1402.6	15	1384	32	1402.6	15	1.4
TS-23	21	1888	0.0891	1.2	2.8270	3.3	0.2311	2.8	1404	24	1340.8	31	1404	24	4.6
TS-23	14	10736	0.0891	1.5	2.6200	3.6	0.2121	2.7	1405	28	1241	31	1405	28	11.7
TS-23	9	992	0.0888	1.7	2.8950	3.5	0.2373	3.0	1407	35	1374	33	1407	35	2.3
TS-23	19	1951	0.0894	2.0	2.8890	3.8	0.2372	2.8	1407	39	1376.6	32	1407	39	2.5
TS-23	87	2075	0.0892	1.5	3.0820	3.6	0.2498	2.6	1408	29	1438	34	1408	29	-2.1
TS-23	24	7803	0.0892	1.7	2.8560	3.3	0.2341	2.7	1408	21	1356	33	1408	21	3.7
TS-23	68	2025	0.0889	1.7	3.0310	3.2	0.2538	2.6	1411	20	1458.1	34	1411	20	-3.3
TS-23	77	9007	0.0894	0.6	2.9060	2.9	0.2375	2.6	1412.3	12	1373.6	32	1412.3	12	2.7
TS-23	23	1900	0.0895	1.1	2.8830	3.2	0.2348	2.6	1415	20	1361.6	32	1415	20	3.9
TS-23	43	1986	0.0895	1.5	3.0810	3.2	0.2479	2.7	1417	29	1428	35	1417	29	-0.7
TS-23	97	4450	0.0897	0.9	3.1270	2.8	0.2489	2.7	1418	18	1435	33	1418	18	-1.1
TS-23	112	26850	0.0897	1.4	2.8570	3.2	0.2348	2.6	1421	22	1359.6	32	1421	22	4.3
TS-23	116	5509	0.0900	1.0	3.0130	3.2	0.2462	2.7	1423	20	1420	33	1423	20	0.3
TS-23	82	3050	0.0900	1.9	3.1610	4.1	0.2529	2.9	1427	38	1450	35	1427	38	-1.8
TS-23	51	1476	0.0904	1.4	3.2330	3.4	0.2549	2.7	1430	28	1462	34	1430	28	-2.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-23	96	2545	0.0896	1.6	2.9500	3.2	0.2343	2.6	1431	18	1357	32	1431	18	5.2
TS-23	20	10446	0.0989	1.2	3.7440	2.9	0.2741	2.6	1602	22	1562	36	1602	22	2.4
TS-23	1	5671	0.1007	0.9	4.2870	2.8	0.3059	2.5	1636.6	17	1720.9	39	1636.6	17	-5.1
TS-23	6	3318	0.1006	2.3	4.2600	4.2	0.3024	3.0	1653	44	1711	41	1653	44	-3.0
TS-23	33	6513	0.1020	0.9	4.0730	3.2	0.2953	2.5	1658	18	1667.5	38	1658	18	-0.6
TS-23	81	1145	0.1020	2.5	4.2040	3.6	0.2980	2.8	1671	24	1681	41	1671	24	-0.6
TS-23	69	2816	0.1029	1.2	4.2650	3.0	0.3078	2.6	1671	13	1730	40	1671	13	-3.5
TS-23	95	4235	0.1027	0.9	4.3330	3.0	0.3025	2.6	1676	16	1704	39	1676	16	-1.7
TS-23	58	10595	0.1040	0.8	4.4600	2.9	0.3156	2.6	1696	14	1767.9	40	1696	14	-4.2
TS-23	55	350000	0.1043	1.2	4.4750	3.1	0.3112	2.6	1699	23	1746	40	1699	23	-2.8
TS-23	110	9260	0.1041	0.9	4.1420	2.9	0.2935	2.6	1701.9	14	1659	38	1701.9	14	2.5
TS-23	107	3638	0.1060	1.7	4.1730	5.0	0.2871	3.2	1723	35	1631	43	1723	35	5.6
TS-23	8	6529	0.1058	1.0	4.4280	3.4	0.3016	2.8	1728	19	1697.2	39	1728	19	1.7
TS-23	44	43550	0.1060	0.9	4.7870	3.1	0.3238	2.7	1730	17	1804	41	1730	17	-4.5
TS-23	54	4800	0.1061	0.9	4.6360	3.0	0.3164	2.6	1736	18	1770	40	1736	18	-2.1
TS-24	87	453	0.0605	6.9	0.1830	6.6	0.0227	3.5	594	74	144.7	5.1	144.7	5.1	75.6
TS-24	46	3148	0.0476	1.3	0.1491	1.9	0.0229	3.1	72	28	146.5	4.1	146.5	4.1	-103.1
TS-24	57	403	0.0468	1.7	0.2071	4.1	0.0320	4.4	36	39	216.8	7.5	216.8	7.5	-463.3
TS-24	119	621	0.0508	2.0	0.2630	11.8	0.0365	10.7	225	47	269	28	269	28	-2.7
TS-24	113	353	0.0520	0.5	0.2923	2.4	0.0411	2.9	282	13	284.2	8.3	284.2	8.3	7.9
TS-24	106	899	0.0505	5.0	0.3260	18.4	0.0458	15.1	200	110	305	45	305	45	-43.0
TS-24	69	461	0.0530	3.2	0.3760	9.8	0.0514	6.8	321	78	355	21	355	21	-0.6
TS-24	19	446	0.0559	0.4	0.5160	2.5	0.0668	3.4	450.9	9.4	450.9	13	450.9	13	7.5
TS-24	117	1158	0.0586	1.6	0.6870	4.7	0.0853	4.2	549	33	538	21	538	21	4.0
TS-24	8	485	0.0590	2.7	0.8910	3.3	0.1083	3.1	546	63	668.7	19	546	63	-21.4
TS-24	98	1515	0.0649	0.8	1.0860	2.6	0.1212	3.1	770	17	770	22	770	17	4.3
TS-24	96	853	0.0727	2.2	1.4680	3.9	0.1544	3.4	997	46	933	29	997	46	7.2
TS-24	70	139	0.0728	2.5	1.5690	5.6	0.1614	4.4	1021	51	990	33	1021	51	5.6
TS-24	83	11057	0.0748	7.2	1.7800	11.2	0.1730	7.5	1043	140	1051	72	1043	140	1.9
TS-24	28	43200	0.0747	1.6	1.6790	4.7	0.1693	2.8	1051	28	1008	26	1051	28	4.1
TS-24	110	1354	0.0769	2.6	1.9780	3.9	0.1885	3.2	1119	54	1115	30	1119	54	0.5
TS-24	10	1480	0.0781	2.9	2.0490	4.2	0.1961	3.1	1166	61	1160	31	1166	61	1.0
TS-24	79	531	0.0846	2.8	2.6750	4.1	0.2270	3.4	1314	55	1321	35	1314	55	-0.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-24	18	23467	0.0886	1.1	3.0300	4.0	0.2430	2.8	1399	18	1402	35	1399	18	-0.2
TS-24	7	13600	0.0890	2.6	2.9420	3.4	0.2395	3.0	1400	51	1383	35	1400	51	1.1
TS-24	77	2667	0.0898	3.7	3.1000	5.5	0.2477	3.6	1418	77	1438	44	1418	77	-0.8
TS-24	95	3207	0.0908	1.7	2.9270	3.4	0.2365	2.7	1452	19	1368	34	1452	19	5.8
TS-24	105	5709	0.0939	3.2	3.5200	6.8	0.2699	4.4	1505	62	1543	56	1505	62	-2.1
TS-24	118	3153	0.1015	1.4	4.2500	3.5	0.2979	3.1	1651	19	1680	46	1651	19	-1.8
TS-24	39	2782	0.1014	2.6	3.4000	4.1	0.2552	3.0	1653	44	1475	40	1653	44	11.4
TS-24	115	34900	0.1018	2.5	4.1800	4.3	0.2931	3.1	1656	43	1655	46	1656	43	0.0
TS-24	1	276400	0.1035	3.9	3.8600	3.4	0.2819	2.6	1687	76	1600.9	38	1687	76	5.1
TS-24	74	1182	0.1039	2.2	4.4100	3.9	0.3120	3.0	1688	26	1753	47	1688	26	-3.9
TS-24	75	6900	0.1033	4.4	4.2500	3.8	0.2988	2.7	1688	81	1686	40	1688	81	0.2
TS-24	55	29900	0.1062	3.3	4.1500	3.4	0.2937	2.7	1733	62	1659	39	1733	62	4.2
TS-24	91	138100	0.1063	0.9	4.3860	2.7	0.3036	2.9	1741	18	1708	44	1741	18	1.9
TS-24	61	524	0.1066	3.2	4.3300	4.2	0.2948	3.0	1753	42	1665	43	1753	42	5.0
TS-24	47	2808	0.1072	3.6	4.5300	3.5	0.3086	2.8	1759	66	1733	40	1759	66	1.5
TS-24	81	2824	0.1328	1.4	6.8900	4.6	0.3748	2.9	2140	21	2051	50	2140	21	4.2
TS-24	53	686	0.2021	1.7	15.1100	3.5	0.5503	2.9	2847	17	2825	66	2847	17	0.8
TS-25	106	934	0.0467	0.6	0.0877	1.8	0.0138	1.7	35	13	88.4	1.5	88.4	1.5	-151.4
TS-25	107	283	0.0474	1.2	0.0886	2.0	0.0138	2.0	55	26	89.2	1.7	89.2	1.7	-60.4
TS-25	103	50	0.0461	0.2	0.0888	3.9	0.0139	3.9	5	4.1	90.4	3.2	90.4	3.2	-1672.0
TS-25	74	249	0.0466	1.4	0.0918	2.7	0.0143	2.7	21	29	92.3	2.2	92.3	2.2	-336.2
TS-25	54	8110	0.0467	1.0	0.0937	1.7	0.0146	1.8	32	16	94.4	1.7	94.4	1.7	-191.6
TS-25	85	1211	0.0472	0.9	0.0947	1.8	0.0148	1.9	50	21	95.4	1.7	95.4	1.7	-89.4
TS-25	102	382	0.0473	1.2	0.0952	1.9	0.0147	1.7	60	26	95.7	1.5	95.7	1.5	-57.0
TS-25	15	1230	0.0526	7.0	0.1069	7.7	0.0150	2.2	502	94	95.7	2.1	95.7	2.1	80.9
TS-25	115	466	0.0471	1.0	0.0954	1.7	0.0148	1.8	53	24	95.9	1.6	95.9	1.6	-78.7
TS-25	30	553	0.0499	3.6	0.1047	5.0	0.0151	1.5	283	58	96.5	1.4	96.5	1.4	65.9
TS-25	116	7335	0.0464	0.9	0.0974	1.8	0.0150	1.9	18	19	96.8	1.6	96.8	1.6	-434.4
TS-25	97	322	0.0464	0.6	0.0939	1.6	0.0147	1.7	12	9.6	96.9	1.8	96.9	1.8	-685.0
TS-25	96	774	0.0469	1.1	0.0968	2.4	0.0150	2.2	29	16	96.9	1.8	96.9	1.8	-230.3
TS-25	6	470	0.0489	2.0	0.0989	2.5	0.0151	2.1	133	44	97	4.4	97	4.4	27.6
TS-25	76	900	0.0478	1.3	0.0980	2.1	0.0151	2.1	82	29	97	1.9	97	1.9	-17.9
TS-25	108	1443	0.0475	1.3	0.0968	1.3	0.0150	1.3	71	27	97.02	1.3	97.02	1.3	-34.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-25	73	971	0.0512	7.4	0.1085	7.6	0.0152	2.2	477	93	97.1	2.1	97.1	2.1	79.6
TS-25	80	491	0.0485	1.8	0.0985	18.3	0.0151	9.3	112	32	97.2	8.5	97.2	8.5	13.8
TS-25	19	302	0.0463	0.3	0.0962	2.3	0.0151	2.3	8.2	6.4	97.4	2.2	97.4	2.2	-1074.4
TS-25	47	121	0.0475	1.4	0.0983	2.6	0.0152	2.7	69	30	98.1	2.5	98.1	2.5	-41.2
TS-25	3	927	0.0478	1.1	0.0992	1.8	0.0153	1.7	84	24	98.4	1.6	98.4	1.6	-16.3
TS-25	4	191	0.0469	1.2	0.0995	2.5	0.0154	2.2	41	25	98.5	2	98.5	2	-140.2
TS-25	45	249	0.0469	0.7	0.0982	1.9	0.0153	2.0	34	14	98.5	1.7	98.5	1.7	-187.6
TS-25	23	2684	0.0524	4.4	0.1103	4.9	0.0154	1.6	385	68	98.7	1.6	98.7	1.6	74.4
TS-25	82	288	0.0474	1.1	0.0994	1.8	0.0154	1.8	52	25	99.2	1.8	99.2	1.8	-90.0
TS-25	90	409	0.0540	5.2	0.1168	4.8	0.0155	1.9	430	53	99.2	1.9	99.2	1.9	76.9
TS-25	100	354	0.0462	0.2	0.0930	1.6	0.0145	1.8	8.7	5.4	99.3	1.8	99.3	1.8	-966.7
TS-25	58	2875	0.0486	4.7	0.1035	5.5	0.0156	1.9	283	57	99.6	1.8	99.6	1.8	64.8
TS-25	61	1566	0.0484	5.2	0.1046	5.2	0.0156	1.8	358	58	99.8	1.8	99.8	1.8	72.1
TS-25	11	2637	0.0466	0.5	0.0992	2.0	0.0156	2.1	20	10	99.8	1.9	99.8	1.9	-399.0
TS-25	24	411	0.0479	3.3	0.1035	3.9	0.0156	1.5	157	41	99.9	1.5	99.9	1.5	36.4
TS-25	31	1566	0.0487	1.6	0.1014	1.9	0.0155	1.7	124	36	100.4	1.5	100.4	1.5	20.0
TS-25	22	404	0.0463	0.6	0.0962	1.9	0.0151	1.9	7.2	5	100.9	1.9	100.9	1.9	-1243.1
TS-25	87	253	0.0591	8.0	0.1264	9.5	0.0158	2.6	680	120	101.1	2.6	101.1	2.6	85.1
TS-25	112	108	0.0465	0.9	0.0938	3.5	0.0147	3.7	20	18	101.3	2.8	101.3	2.8	-370.0
TS-25	34	185	0.0464	0.6	0.0962	2.9	0.0152	3.0	15	13	102.9	2.6	102.9	2.6	-546.7
TS-25	101	3590	0.0505	7.5	0.1133	7.8	0.0161	2.2	462	100	103.2	2.2	103.2	2.2	77.7
TS-25	41	349	0.0471	1.1	0.1058	2.0	0.0163	2.0	48	22	104.3	1.8	104.3	1.8	-116.7
TS-25	95	123	0.0462	0.2	0.0980	2.2	0.0153	2.4	5.7	3.9	104.4	2.5	104.4	2.5	-1615.8
TS-25	16	319	0.0463	0.7	0.1027	2.4	0.0161	2.6	6.3	3.9	105.5	2.4	105.5	2.4	-1536.5
TS-25	72	169	0.0461	0.0	0.0967	2.3	0.0152	2.4	1.81	0.28	109.2	2.4	109.2	2.4	-5270.2
TS-25	35	202	0.0461	0.0	0.0996	2.3	0.0157	2.6	2.4	0.13	110.9	2.3	110.9	2.3	-4070.8
TS-25	14	83	0.0461	0.1	0.0999	2.9	0.0157	3.1	1.91	1.7	114.2	2.6	114.2	2.6	-5140.8
TS-25	1	155	0.0477	1.3	0.1258	2.1	0.0193	2.0	81	29	123.2	2.2	123.2	2.2	-51.7
TS-25	48	301	0.0481	1.5	0.1671	2.2	0.0258	1.7	100	34	165.5	2.7	165.5	2.7	-64.4
TS-25	81	1239	0.0511	1.7	0.3037	2.5	0.0433	1.6	237	39	273.8	4	273.8	4	-15.1
TS-25	52	1701	0.0496	1.8	0.3032	2.4	0.0445	1.7	170	41	282.5	4.3	282.5	4.3	-65.1
TS-25	70	829	0.0501	2.2	0.3028	2.4	0.0448	1.6	191	47	287.2	4.9	287.2	4.9	-48.0
TS-25	26	3482	0.0570	3.3	0.4710	3.4	0.0600	1.6	489	43	375.3	5.9	375.3	5.9	23.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-25	18	587	0.0556	3.6	0.4740	3.8	0.0616	1.6	422	47	385.2	6	385.2	6	8.7
TS-25	89	415	0.0538	2.4	0.4680	2.8	0.0644	2.2	347	52	410	8.1	410	8.1	-16.2
TS-25	39	239	0.0535	2.1	0.5110	2.5	0.0694	2.2	336	46	432.9	8.2	432.9	8.2	-28.8
TS-25	25	2990	0.0565	1.7	0.5426	2.4	0.0697	1.2	485	24	434.6	5.2	434.6	5.2	10.4
TS-25	69	5964	0.0564	1.1	0.5557	2.7	0.0706	2.0	467	26	440.4	8.2	440.4	8.2	5.8
TS-25	66	1980	0.0546	2.0	0.5550	3.4	0.0739	2.3	387	48	460.8	9.8	460.8	9.8	-18.8
TS-25	2	431	0.0583	1.5	0.6170	4.7	0.0788	4.3	540	34	493	20	493	20	9.4
TS-25	50	350000	0.0567	2.3	0.6830	3.2	0.0880	2.3	484	54	545.7	11	545.7	11	-12.6
TS-25	91	3713	0.0605	1.7	0.7980	2.3	0.0967	1.6	622	33	596.8	8.6	596.8	8.6	4.4
TS-25	38	3362	0.0605	1.5	0.8370	2.2	0.1003	1.4	623	33	617.9	7.6	617.9	7.6	1.1
TS-25	43	2767	0.0709	1.6	1.5840	2.6	0.1609	1.4	955	32	962.1	12	962.1	12	-0.7
TS-25	42	1036	0.0733	1.6	1.6750	2.7	0.1671	1.4	1022	34	998.6	12	998.6	12	2.4
TS-25	109	6511	0.0745	1.1	1.7320	2.3	0.1701	1.2	1053	22	1011.6	11	1011.6	11	3.8
TS-25	40	7470	0.0747	2.1	1.8070	3.2	0.1750	1.5	1075	51	1040	13	1040	13	3.3
TS-25	111	7929	0.0733	1.5	1.8010	2.5	0.1763	1.2	1027	29	1046.5	12	1046.5	12	-1.9
TS-25	65	155	0.0720	3.2	1.6200	4.9	0.1693	3.0	962	68	1048	25	1048	25	-4.7
TS-25	44	593	0.0756	2.2	1.8420	3.3	0.1769	1.5	1094	47	1051.5	14	1051.5	14	3.8
TS-25	29	35825	0.0751	1.1	1.8410	2.2	0.1788	1.4	1066	18	1062	14	1062	14	0.4
TS-25	67	4654	0.0758	1.3	1.9410	2.8	0.1856	1.6	1092	30	1099	15	1099	15	-0.5
TS-25	71	247	0.0757	3.4	1.8180	4.1	0.1790	1.8	1079	67	1105	24	1105	24	1.7
TS-25	27	676	0.0745	3.1	1.9110	3.6	0.1870	1.6	1044	45	1105	16	1105	16	-5.8
TS-25	64	9348	0.0772	1.8	2.0260	2.8	0.1876	1.3	1127	25	1108.3	14	1108.3	14	1.7
TS-25	114	29367	0.0774	1.9	2.1030	4.8	0.1918	3.0	1137	43	1131	30	1131	30	0.5
TS-25	78	523	0.0773	6.2	2.0500	6.3	0.1923	2.2	1141	69	1136	23	1136	23	0.4
TS-25	84	6382	0.0816	1.3	2.2020	2.5	0.1977	1.4	1238	26	1163.1	13	1163.1	13	6.1
TS-25	53	13886	0.0782	0.9	2.1750	2.3	0.1999	1.2	1150.5	19	1174.9	13	1174.9	13	-2.1
TS-25	83	2249	0.0797	1.6	2.1840	2.6	0.2007	1.4	1179	35	1179.6	15	1179.6	15	-0.2
TS-25	33	405	0.0822	3.4	2.1820	4.2	0.1997	1.7	1226	67	1200	18	1200	18	4.1
TS-25	98	18125	0.0830	1.1	2.4680	2.5	0.2146	1.3	1268	20	1254.6	15	1254.6	15	1.2
TS-25	75	1360	0.0858	1.6	2.6460	2.9	0.2250	1.4	1329	34	1312	17	1312	17	1.5
TS-25	86	6607	0.0863	1.6	2.7400	2.9	0.2277	1.3	1352	34	1323	15	1323	15	2.2
TS-25	36	2881	0.0875	1.0	2.8560	2.6	0.2323	1.3	1370	20	1347	16	1347	16	1.7
TS-25	63	1739	0.0926	1.1	3.1800	2.4	0.2496	1.2	1485	21	1437	16	1437	16	3.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-25	62	2632	0.0895	2.0	3.1880	3.5	0.2568	1.6	1410	40	1472	19	1472	19	-4.5
TS-25	9	1862	0.0915	1.3	3.2790	2.4	0.2589	1.4	1459	26	1485	18	1485	18	-1.7
TS-25	28	7475	0.0989	1.0	3.8220	2.3	0.2815	1.3	1604	19	1597	19	1597	19	0.4
TS-25	7	4054	0.1037	1.3	4.2260	2.3	0.2945	1.3	1690	22	1664	19	1664	19	1.5
TS-25	118	37025	0.1062	0.8	4.5150	2.2	0.3079	1.2	1740.7	15	1730.4	18	1730.4	18	0.6
TS-25	8	3265	0.1039	1.4	4.4370	2.7	0.3082	1.4	1691	27	1731	20	1731	20	-2.4
TS-25	105	32850	0.1068	0.8	4.5640	2.1	0.3097	1.1	1744.3	15	1738.9	17	1738.9	17	0.3
TS-25	119	13014	0.1098	1.0	4.7360	1.2	0.3115	0.8	1798	19	1750	13	1750	13	2.7
TS-25	37	13014	0.1098	1.0	4.7360	2.3	0.3115	1.5	1798	17	1750	23	1750	23	2.7
TS-25	13	5188	0.1073	2.1	4.7660	2.7	0.3201	1.3	1764	38	1792	20	1792	20	-1.5
TS-25	32	19350	0.1079	1.2	4.9380	2.2	0.3318	1.4	1764	23	1847	22	1847	22	-4.6
TS-25	57	724	0.1151	1.6	5.3650	2.6	0.3378	1.4	1877	28	1879	22	1879	22	0.1
TS-25	92	5520	0.1147	1.0	5.4300	2.4	0.3421	1.3	1883	19	1897	21	1897	21	-0.7
TS-25	104	4965	0.1222	1.2	5.9190	2.2	0.3524	1.2	1987	22	1945	21	1945	21	2.1
TS-25	12	2648	0.1455	1.2	8.8000	2.6	0.4360	1.3	2292	22	2331	24	2331	24	-1.7
TS-25	20	4225	0.1534	2.2	9.8700	4.5	0.4640	2.4	2377	38	2456	46	2456	46	-3.2
TS-25	113	9588	0.1687	1.4	11.4900	2.3	0.4904	1.3	2548	24	2575	29	2575	29	-1.0
TS-25	93	5538	0.1778	1.1	12.2800	2.4	0.5013	1.2	2631.8	19	2622	26	2622	26	0.5
TS-25	79	2644	0.1855	1.8	13.5900	3.3	0.5286	1.6	2702	31	2735	33	2735	33	-1.2
TS-25	56	5986	0.1813	1.0	13.3760	2.6	0.5333	1.2	2665.1	18	2759	26	2759	26	-3.4
TS-25	110	8886	0.1884	1.2	13.9800	2.5	0.5378	1.2	2728	20	2776	27	2776	27	-1.7
TS-25	99	5210	0.1953	1.1	14.7200	2.6	0.5457	1.3	2788	19	2809	30	2809	30	-0.7
TS-26	7	311	0.0504	6.7	0.1012	7.2	0.0143	3.4	417	90	91.3	3.1	91.3	3.1	78.1
TS-26	118	458	0.0467	1.0	0.0947	2.0	0.0148	3.4	31	22	95.5	3.1	95.5	3.1	-205.5
TS-26	84	172	0.0468	1.0	0.0949	1.8	0.0147	3.2	36	23	95.9	3.1	95.9	3.1	-161.9
TS-26	104	1378	0.0575	8.0	0.1193	9.2	0.0153	3.3	615	100	97.6	3.2	97.6	3.2	84.1
TS-26	5	195	0.0470	1.2	0.0983	2.0	0.0155	3.6	44	26	99.6	3.3	99.6	3.3	-124.5
TS-26	50	479	0.0474	1.4	0.0994	2.0	0.0155	3.4	63	30	99.9	3.4	99.9	3.4	-57.5
TS-26	76	2070	0.0470	1.1	0.1012	2.3	0.0156	3.5	45	24	100.2	3.3	100.2	3.3	-121.1
TS-26	98	1438	0.0468	1.4	0.0984	2.2	0.0154	3.5	32	29	100.7	3.2	100.7	3.2	-208.4
TS-26	71	846	0.0476	1.6	0.1024	2.7	0.0159	4.0	71	32	102.7	3.6	102.7	3.6	-43.2
TS-26	79	347	0.0473	1.1	0.1070	2.3	0.0165	3.6	53	25	106	3.5	106	3.5	-99.1
TS-26	68	116	0.0468	0.8	0.1045	3.7	0.0164	4.6	26	18	106.2	4.8	106.2	4.8	-303.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-26	18	1445	0.0474	1.5	0.1091	1.6	0.0168	3.5	61	29	107.3	3.3	107.3	3.3	-75.6
TS-26	56	453	0.0484	2.3	0.1143	1.8	0.0175	3.3	110	51	111.9	3.4	111.9	3.4	-1.5
TS-26	114	353	0.0474	1.5	0.1655	2.0	0.0256	3.4	63	34	166.9	5.2	166.9	5.2	-158.6
TS-26	67	11840	0.0537	4.8	0.2130	21.1	0.0292	3.4	391	200	185.3	6.6	185.3	6.6	52.6
TS-26	86	645	0.0493	2.4	0.2372	2.2	0.0354	3.4	149	54	226.3	6.9	226.3	6.9	-50.3
TS-26	117	386	0.0465	1.2	0.2190	2.8	0.0340	3.5	23	26	227.4	7.3	227.4	7.3	-835.7
TS-26	60	471	0.0489	3.1	0.3263	4.0	0.0481	3.5	136	71	310.6	10	310.6	10	-122.7
TS-26	63	1224	0.0579	4.5	0.4080	3.9	0.0514	3.1	530	58	322.8	9.7	322.8	9.7	39.1
TS-26	22	1753	0.0519	2.9	0.4130	2.7	0.0591	3.0	267	65	375.2	11	375.2	11	-38.6
TS-26	81	480	0.0545	1.6	0.4531	2.1	0.0614	3.7	396	36	387.8	12	387.8	12	3.1
TS-26	83	1527	0.0561	2.3	0.4989	2.6	0.0653	3.2	450	53	408.7	12	408.7	12	9.4
TS-26	101	382	0.0523	3.4	0.4610	4.3	0.0635	3.5	285	80	408.8	14	408.8	14	-39.6
TS-26	80	605	0.0528	2.7	0.4700	3.0	0.0648	3.2	311	60	409	12	409	12	-30.2
TS-26	51	3053	0.0541	3.1	0.5180	2.9	0.0690	3.2	368	75	432.6	12	432.6	12	-16.9
TS-26	29	535	0.0567	2.5	0.5570	2.5	0.0721	3.3	479	52	450.4	13	450.4	13	6.3
TS-26	55	840	0.0557	5.2	0.5710	5.1	0.0724	3.2	509	65	450.8	14	450.8	14	11.4
TS-26	15	1118	0.0525	3.0	0.5870	3.9	0.0802	3.7	293	69	499.6	16	499.6	16	-69.7
TS-26	19	1958	0.0574	2.3	0.6490	2.5	0.0831	3.4	502	51	515.4	15	515.4	15	-2.5
TS-26	88	549	0.0584	3.6	0.7670	3.7	0.0958	3.7	523	56	594.8	18	523	56	-12.7
TS-26	62	471	0.0587	3.1	0.7690	3.9	0.0967	3.6	532	74	600.4	19	532	74	-11.8
TS-26	25	1986	0.0601	1.8	0.8020	2.4	0.0977	3.4	608	41	603.1	18	608	41	1.2
TS-26	35	1074	0.0640	4.1	1.0380	6.6	0.1162	5.2	737	85	737	35	737	85	4.1
TS-26	14	3528	0.0718	2.8	1.5910	2.6	0.1606	3.2	988	57	961	27	988	57	2.8
TS-26	91	3025	0.0746	3.1	1.8380	4.1	0.1821	4.0	1037	67	1089	35	1037	67	-4.0
TS-26	78	2653	0.0744	2.4	1.8360	2.8	0.1807	3.3	1046	49	1071.2	30	1046	49	-2.4
TS-26	20	1561	0.0739	3.5	1.8780	3.4	0.1830	3.2	1052	76	1084.7	30	1052	76	-3.0
TS-26	40	6986	0.0741	3.0	1.8840	2.9	0.1839	3.0	1054	58	1087.8	30	1054	58	-3.2
TS-26	119	36900	0.0753	2.0	1.9720	3.0	0.1907	3.0	1059	35	1125.2	31	1059	35	-6.3
TS-26	69	332	0.0752	2.9	1.9030	2.9	0.1830	3.2	1067	59	1085	31	1067	59	-1.5
TS-26	89	24380	0.0755	2.9	1.8680	2.9	0.1799	3.0	1069	64	1069.6	30	1069	64	0.2
TS-26	115	2156	0.0756	2.8	1.8220	3.1	0.1764	3.0	1077	55	1048	30	1077	55	2.8
TS-26	39	1671	0.0760	3.2	1.9130	3.2	0.1835	3.1	1088	65	1088.3	30	1088	65	0.2
TS-26	120	24175	0.0758	1.8	1.8700	2.7	0.1799	2.9	1090	38	1066.4	29	1090	38	2.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-26	33	934	0.0759	3.2	1.9550	3.8	0.1875	3.6	1093	69	1115	33	1093	69	-1.6
TS-26	110	5835	0.0766	2.2	1.9920	2.4	0.1882	3.1	1110	43	1113.2	30	1110	43	-0.2
TS-26	57	3326	0.0769	2.6	1.9310	3.0	0.1813	3.0	1116	55	1075.4	29	1116	55	3.8
TS-26	31	1274	0.0770	2.7	1.9370	3.2	0.1852	3.2	1117	55	1096.1	30	1117	55	1.8
TS-26	75	681	0.0782	2.6	2.0430	3.2	0.1898	3.1	1152	55	1122.4	31	1152	55	2.8
TS-26	30	31280	0.0784	2.7	2.1400	3.0	0.1968	3.2	1158	52	1157	33	1158	52	0.0
TS-26	77	1067	0.0788	3.0	2.1450	3.3	0.1998	3.2	1165	66	1176.5	32	1165	66	-0.8
TS-26	97	2567	0.0793	2.5	2.1400	3.2	0.1968	3.2	1178	53	1157.5	32	1178	53	1.7
TS-26	4	4328	0.0803	3.1	2.1380	3.2	0.1964	3.3	1205	67	1160.4	32	1205	67	4.1
TS-26	17	4394	0.0828	2.7	2.4910	3.1	0.2165	3.1	1263	56	1263	35	1263	56	0.0
TS-26	73	1518	0.0831	2.3	2.5470	2.7	0.2209	3.4	1264	45	1286.4	35	1264	45	-1.7
TS-26	109	5633	0.0835	3.0	2.5890	3.5	0.2243	3.3	1275	57	1304	36	1275	57	-2.3
TS-26	48	8773	0.0836	2.0	2.5120	2.7	0.2176	3.0	1282	40	1269	34	1282	40	1.0
TS-26	70	1154	0.0840	2.9	2.4640	3.4	0.2127	2.9	1299	61	1243	34	1299	61	4.3
TS-26	41	2762	0.0864	2.2	2.6010	2.7	0.2193	3.0	1348	44	1278.3	34	1348	44	5.2
TS-26	103	3713	0.0872	2.6	2.7910	3.3	0.2330	3.2	1362	50	1348	40	1362	50	0.9
TS-26	113	4305	0.0880	2.8	2.9410	2.9	0.2424	2.9	1380	56	1399.5	37	1380	56	-1.4
TS-26	21	9458	0.0892	1.6	2.9270	2.9	0.2364	3.0	1413	45	1368	37	1413	45	3.2
TS-26	108	3361	0.0898	2.7	3.0540	3.6	0.2487	3.1	1421	62	1433.2	38	1421	62	-0.7
TS-26	95	695	0.0900	4.2	3.0800	3.9	0.2458	3.4	1428	81	1419	40	1428	81	0.8
TS-26	10	1870	0.0913	3.4	3.3630	3.9	0.2634	2.9	1454	68	1509	41	1454	68	-3.6
TS-26	26	1267	0.0929	3.7	3.2240	3.4	0.2525	1.8	1469	45	1456	45	1469	45	1.2
TS-26	106	751	0.0929	4.0	3.1430	5.4	0.2487	3.9	1480	74	1440	43	1480	74	3.3
TS-26	34	7543	0.0940	1.2	3.3920	2.8	0.2621	3.0	1503	29	1503	40	1503	29	0.0
TS-26	38	13729	0.0939	2.1	3.4580	2.6	0.2684	3.0	1505	40	1532.5	40	1505	40	-1.8
TS-26	37	1439	0.0980	3.5	3.7630	3.5	0.2806	3.4	1583	67	1592	43	1583	67	-0.7
TS-26	65	9112	0.0983	4.5	3.8060	4.7	0.2821	3.9	1591	88	1601	56	1591	88	-0.7
TS-26	61	1946	0.0998	2.1	3.9270	2.8	0.2879	3.0	1620	40	1629	43	1620	40	-0.7
TS-26	107	915	0.1005	4.3	4.0500	4.7	0.2946	3.2	1640	76	1664	44	1640	76	-1.5
TS-26	94	38900	0.1007	1.8	4.0380	3.0	0.2903	3.0	1641	39	1643	44	1641	39	-0.1
TS-26	93	1421	0.1010	3.2	4.0810	3.4	0.2924	3.0	1643	53	1652	44	1643	53	-0.6
TS-26	66	23023	0.1010	3.0	4.0610	3.0	0.2917	3.1	1643	55	1647	43	1643	55	-0.4
TS-26	54	1011	0.1029	2.6	4.1540	3.1	0.2940	3.4	1674	44	1660	44	1674	44	0.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-26	53	7002	0.1038	2.5	4.3480	3.0	0.3028	3.0	1692	47	1704	45	1692	47	-0.8
TS-26	36	1393	0.1042	3.6	4.1570	3.6	0.2914	3.4	1703	68	1650	43	1703	68	3.2
TS-26	87	2506	0.1048	3.1	4.3250	3.7	0.3023	3.1	1709	61	1703	45	1709	61	0.4
TS-26	8	372	0.1049	6.0	4.2200	5.9	0.2928	3.4	1710	100	1655	46	1710	100	3.2
TS-26	111	4074	0.1061	3.4	4.8550	2.9	0.3305	2.9	1732	60	1841	47	1732	60	-6.3
TS-26	16	3833	0.1072	2.4	4.5480	3.1	0.3098	3.0	1755	42	1739	45	1755	42	0.9
TS-26	12	10071	0.1076	2.1	4.7860	2.5	0.3231	3.0	1759	39	1805	47	1759	39	-2.6
TS-26	59	12781	0.1080	2.5	4.6830	2.8	0.3141	3.0	1764.9	48	1760.5	46	1764.9	48	0.2
TS-26	3	26517	0.1087	2.1	4.7990	2.7	0.3217	2.9	1777.8	39	1798.1	46	1777.8	39	-1.2
TS-26	96	1227	0.1089	4.1	4.4440	2.9	0.2963	3.1	1779	73	1670	47	1779	73	6.0
TS-26	64	4075	0.1095	2.8	4.9560	3.4	0.3280	2.8	1794	50	1828	47	1794	50	-1.9
TS-26	28	30050	0.1103	0.8	4.9680	2.6	0.3268	3.0	1804.1	39	1822.7	47	1804.1	39	-1.0
TS-26	27	10200	0.1125	1.0	5.2300	2.7	0.3365	3.0	1839.5	33	1871	49	1839.5	33	-1.7
TS-26	72	1354	0.1123	3.2	4.9820	3.2	0.3241	2.8	1840	58	1809	48	1840	58	1.7
TS-26	105	147200	0.1178	2.4	5.5860	2.7	0.3433	3.2	1925	45	1902	51	1925	45	1.2
TS-26	90	4357	0.1288	2.4	6.9460	2.6	0.3900	3.1	2080	43	2123	55	2080	43	-2.1
TS-26	49	1574	0.1301	2.8	6.7700	3.2	0.3808	3.2	2111	56	2080	53	2111	56	1.5
TS-26	2	4227	0.1376	2.8	7.4030	3.5	0.3950	3.5	2196	44	2139	54	2196	44	2.3
TS-26	45	2271	0.1531	5.0	9.4700	7.3	0.4460	4.5	2375	81	2378	84	2375	81	0.1
TS-26	9	1564	0.1699	3.2	11.0600	3.2	0.4734	3.0	2556	53	2498	62	2556	53	2.3
TS-26	58	10260	0.1872	3.5	13.8000	4.1	0.5279	2.5	2725	69	2734	67	2725	69	-0.3
TS-26	32	7591	0.1943	2.5	14.5700	2.8	0.5427	2.9	2778	40	2798	68	2778	40	-0.6
TS-26	82	1716	0.1986	3.0	15.0700	3.6	0.5487	2.9	2813	49	2828	68	2813	49	-0.2
TS-27	64	188	0.0473	1.5	0.0937	2.6	0.0146	2.7	59	32	93.3	2.2	93.3	2.2	-58.1
TS-27	70	251	0.0501	6.6	0.1039	7.1	0.0153	2.9	370	86	97.7	2.8	97.7	2.8	73.6
TS-27	78	1005	0.0465	0.5	0.0983	1.8	0.0153	2.2	21	11	98.4	2	98.4	2	-366.7
TS-27	89	865	0.0585	5.8	0.1860	6.5	0.0234	2.6	543	89	149.1	3.8	149.1	3.8	72.5
TS-27	55	1181	0.0504	9.7	0.1700	10.6	0.0235	4.0	510	110	149.9	5.8	149.9	5.8	70.6
TS-27	23	927	0.0496	2.0	0.3173	3.5	0.0463	1.9	169	47	298	5.1	298	5.1	-72.5
TS-27	79	1509	0.0527	3.0	0.3730	4.0	0.0523	2.3	303	70	331	6.8	331	6.8	-8.4
TS-27	24	1219	0.0527	2.8	0.3770	4.0	0.0529	2.1	301	66	335.8	6.2	335.8	6.2	-10.4
TS-27	17	158	0.0517	2.9	0.3640	4.9	0.0511	2.3	265	67	344.1	6.9	344.1	6.9	-21.3
TS-27	66	2579	0.0517	2.5	0.3985	3.3	0.0561	1.8	265	60	352.1	5.6	352.1	5.6	-32.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-27	31	2180	0.0521	1.9	0.4194	2.9	0.0589	1.9	289	47	370.2	6.5	370.2	6.5	-27.6
TS-27	103	1250	0.0537	2.1	0.4599	3.0	0.0617	1.9	352	50	386.8	6.7	386.8	6.7	-9.7
TS-27	72	611	0.0516	2.7	0.4450	4.5	0.0622	2.1	255	62	399.1	7	399.1	7	-52.5
TS-27	25	1236	0.0546	2.9	0.4730	4.0	0.0641	1.9	383	68	404	6.6	404	6.6	-4.5
TS-27	119	1231	0.0541	2.4	0.4986	2.6	0.0671	1.9	413	42	420.5	7.4	420.5	7.4	-1.4
TS-27	81	157	0.0540	3.0	0.5130	4.1	0.0688	2.0	362	69	467.6	9	467.6	9	-18.4
TS-27	43	358	0.0575	0.9	0.6260	4.0	0.0783	2.3	512	19	507.3	10	507.3	10	5.1
TS-27	113	289	0.0583	3.6	0.7890	4.4	0.0985	2.3	524	84	612.3	12	524	84	-15.6
TS-27	95	5745	0.0596	2.3	0.7790	3.7	0.0967	2.1	589	48	597	10	589	48	-1.0
TS-27	36	1429	0.0604	1.4	0.7970	2.8	0.0963	2.0	614	30	592.7	10	614	30	3.5
TS-27	39	2945	0.0618	1.3	0.8740	3.1	0.1039	1.7	667	28	637.8	10	667	28	4.5
TS-27	65	972	0.0629	2.9	1.0150	3.3	0.1167	2.1	696	65	713.8	13	696	65	-2.2
TS-27	1	491	0.0661	1.7	1.1450	8.6	0.1247	3.7	807	35	807	26	807	35	6.2
TS-27	86	25130	0.0702	2.6	1.4980	4.1	0.1557	1.9	942	37	933	16	942	37	1.0
TS-27	35	3208	0.0710	2.1	1.6000	3.0	0.1634	1.6	958	45	972.2	15	958	45	-1.8
TS-27	111	3639	0.0735	1.3	1.7360	3.1	0.1719	1.7	1030	25	1022.4	16	1030	25	0.7
TS-27	38	1661	0.0757	2.4	1.9180	3.7	0.1859	1.9	1086	44	1099	18	1086	44	-1.2
TS-27	84	1312	0.0768	2.1	2.0620	3.5	0.1949	1.9	1128	48	1150.4	18	1128	48	-1.7
TS-27	47	2116	0.0773	1.8	1.9360	3.6	0.1820	1.8	1131	37	1076.9	17	1131	37	4.7
TS-27	104	2482	0.0781	1.3	2.1250	3.1	0.1978	1.6	1147	26	1163.5	17	1147	26	-1.4
TS-27	96	2288	0.0819	2.1	2.5440	4.7	0.2233	1.8	1250	47	1299	21	1250	47	-3.9
TS-27	6	4072	0.0826	1.3	2.3710	3.4	0.2086	1.7	1257	33	1221.7	18	1257	33	2.8
TS-27	102	255	0.0856	3.4	2.5460	5.1	0.2224	2.6	1309	69	1308	28	1309	69	1.1
TS-27	93	475	0.0884	4.8	2.6800	7.8	0.2290	2.6	1368	100	1357	24	1368	100	2.9
TS-27	40	390	0.0881	3.9	2.7200	6.6	0.2266	2.5	1394	72	1366	27	1394	72	5.6
TS-27	42	15460	0.0901	2.2	2.9530	4.7	0.2385	2.1	1428	44	1386	25	1428	44	3.5
TS-27	57	603	0.0924	4.8	3.0900	8.4	0.2474	3.2	1463	89	1461	38	1463	89	2.7
TS-27	105	801	0.0918	2.4	3.2610	4.0	0.2559	2.0	1468	48	1472	22	1468	48	-0.1
TS-27	56	1162	0.0932	2.3	3.2400	4.3	0.2524	2.1	1487	44	1454	25	1487	44	2.4
TS-27	34	2522	0.0930	2.4	3.1220	4.8	0.2457	2.3	1493	48	1414	28	1493	48	5.2
TS-27	109	11456	0.0946	1.3	3.5490	3.1	0.2743	1.6	1508	18	1562.6	22	1508	18	-3.6
TS-27	3	961	0.1009	2.6	3.6420	4.4	0.2695	2.0	1631	48	1545	26	1631	48	5.7
TS-27	92	3182	0.1024	1.9	3.9370	4.1	0.2783	1.8	1665	34	1582	25	1665	34	4.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-27	110	5243	0.1028	1.2	4.3270	3.7	0.3053	1.7	1674	21	1720	25	1674	21	-2.7
TS-27	12	103600	0.1029	1.3	4.2030	3.3	0.2975	1.8	1680	20	1678	27	1680	20	0.1
TS-27	76	7773	0.1033	1.1	4.0150	3.2	0.2821	1.7	1683.2	20	1602	24	1683.2	20	4.8
TS-27	46	9367	0.1035	2.5	4.0300	4.2	0.2829	2.4	1685	48	1599	39	1685	48	4.7
TS-27	5	10100	0.1033	1.4	4.1200	3.4	0.2884	1.6	1686	26	1631	24	1686	26	3.1
TS-27	54	34450	0.1033	1.1	4.3640	3.2	0.3038	1.6	1696	23	1710	25	1696	23	-0.8
TS-27	29	6471	0.1041	1.3	4.4090	3.6	0.3067	1.8	1697	25	1725	26	1697	25	-1.6
TS-27	19	2972	0.1042	1.4	4.2780	3.7	0.2976	1.8	1699	26	1684	27	1699	26	1.1
TS-27	106	5364	0.1045	1.3	4.4800	2.9	0.3114	1.6	1705	24	1747	25	1705	24	-2.5
TS-27	53	6789	0.1050	1.2	4.3440	3.0	0.3004	1.7	1714	23	1694	25	1714	23	1.2
TS-27	118	2140	0.1051	2.2	4.1740	3.6	0.2894	1.8	1719	41	1643	24	1719	41	4.7
TS-27	30	1174	0.1050	2.5	4.0500	4.4	0.2869	2.3	1721	45	1638	31	1721	45	5.5
TS-27	2	40418	0.1054	0.9	4.5780	3.3	0.3141	1.6	1721	18	1762.1	25	1721	18	-2.3
TS-27	107	23250	0.1056	1.7	4.3040	3.3	0.2975	1.7	1723	31	1678	24	1723	31	2.6
TS-27	116	1033	0.1059	1.4	4.2120	3.6	0.2920	1.8	1732	27	1650	25	1732	27	4.6
TS-27	9	2708	0.1061	1.8	4.2880	4.0	0.2956	1.9	1735	32	1667	29	1735	32	3.8
TS-27	20	386	0.1069	2.3	4.3100	7.0	0.2916	3.0	1744	43	1667	41	1744	43	5.5
TS-27	91	8657	0.1076	1.5	4.8980	3.7	0.3292	1.8	1762	29	1835	28	1762	29	-4.1
TS-27	97	451	0.1089	4.0	4.3700	6.6	0.2959	2.5	1772	80	1699	29	1772	80	5.7
TS-27	88	2217	0.1099	1.5	4.6620	3.4	0.3099	1.7	1796	27	1742	25	1796	27	3.1
TS-27	67	1008	0.1122	2.2	4.6700	4.5	0.3084	2.0	1841	40	1743	29	1841	40	5.9
TS-27	37	778	0.1148	2.0	4.9300	4.3	0.3143	2.2	1881	40	1773	30	1881	40	6.4
TS-28	4	202	0.0476	1.4	0.1021	2.3	0.0158	2.7	75	33	101.4	2.6	101.4	2.6	-34.7
TS-28	31	1380	0.0481	1.5	0.1488	3.0	0.0223	1.9	102	35	142	2.7	142	2.7	-39.2
TS-28	32	849	0.0479	1.8	0.1499	2.5	0.0228	2.4	87	39	145	3.1	145	3.1	-66.9
TS-28	30	490	0.0541	0.3	0.4154	3.9	0.0557	2.3	374.8	6	374.8	8.5	374.8	8.5	6.8
TS-28	112	5567	0.0606	0.6	0.8150	4.2	0.0975	2.9	623	13	623	17	623	13	3.9
TS-28	99	3082	0.0630	0.4	0.9680	3.6	0.1113	2.2	709.4	7.7	709.4	14	709.4	7.7	4.1
TS-28	108	1372	0.0691	1.6	1.3650	6.2	0.1425	3.9	896	33	892	31	896	33	4.2
TS-28	27	8964	0.0755	0.8	2.0090	2.6	0.1906	1.9	1081	15	1124.9	19	1081	15	-4.1
TS-28	5	858	0.0756	1.2	1.7450	3.6	0.1695	2.2	1082	24	1012.6	18	1082	24	6.7
TS-28	44	696	0.0758	1.6	1.7550	3.4	0.1705	2.3	1085	33	1018	21	1085	33	6.5
TS-28	78	1173	0.0787	0.7	2.0670	4.8	0.1907	2.3	1165	14	1165	22	1165	14	3.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-28	77	1197	0.0790	1.1	1.9630	2.9	0.1836	2.0	1169	21	1088.6	19	1169	21	7.1
TS-28	39	3617	0.0896	2.0	2.9190	3.8	0.2378	2.0	1422	38	1376	25	1422	38	3.3
TS-28	9	6642	0.0903	1.8	2.9390	3.2	0.2369	2.0	1432	34	1371	24	1432	34	4.3
TS-28	63	2731	0.0909	1.4	3.1360	3.5	0.2493	2.2	1440	28	1436	25	1440	28	0.4
TS-28	120	785	0.1016	1.8	4.3020	3.5	0.3020	2.2	1647	34	1706	30	1647	34	-3.3
TS-28	48	648	0.1018	2.6	4.1100	4.9	0.2934	2.5	1656	51	1659	30	1656	51	-0.3
TS-28	97	657	0.1032	5.3	4.3600	7.6	0.3059	3.3	1660	100	1728	40	1660	100	-3.6
TS-28	12	7539	0.1023	0.6	3.9930	3.0	0.2816	2.0	1666	10	1599	28	1666	10	4.0
TS-28	117	15383	0.1023	0.7	4.1150	3.2	0.2937	2.0	1666	12	1660	28	1666	12	0.4
TS-28	113	2059	0.1024	1.6	4.1850	3.6	0.2963	2.0	1668	28	1671	29	1668	28	-0.3
TS-28	16	39550	0.1026	0.8	4.3830	2.7	0.3082	1.8	1668.7	7.7	1733	28	1668.7	7.7	-3.9
TS-28	58	1843	0.1026	0.8	4.4350	3.2	0.3130	1.9	1669	16	1756	29	1669	16	-5.2
TS-28	8	3714	0.1026	0.4	4.3580	2.8	0.3053	1.8	1671.6	6.5	1717.4	27	1671.6	6.5	-2.8
TS-28	11	18157	0.1027	0.4	4.4700	3.1	0.3150	2.0	1673	7.9	1763	29	1673	7.9	-5.5
TS-28	100	3120	0.1029	1.1	4.4960	3.1	0.3128	2.0	1676	20	1756	30	1676	20	-4.8
TS-28	7	2900	0.1031	0.7	4.1070	3.4	0.2890	2.1	1679	12	1639	30	1679	12	2.6
TS-28	86	894	0.1032	2.8	4.3000	5.6	0.3031	2.7	1681	55	1703	36	1681	55	-1.4
TS-28	37	7063	0.1032	0.6	4.2810	2.6	0.3010	1.9	1682	11	1697	27	1682	11	-0.8
TS-28	15	4383	0.1032	0.5	4.3690	3.0	0.3070	1.9	1682.6	9.4	1726	29	1682.6	9.4	-2.6
TS-28	68	7261	0.1033	0.7	4.1800	2.6	0.2952	1.9	1683	13	1668	28	1683	13	0.8
TS-28	24	3477	0.1033	1.3	4.3090	3.5	0.3028	2.1	1685	24	1702	31	1685	24	-1.2
TS-28	92	350000	0.1032	1.6	4.2500	4.0	0.2998	2.3	1685	32	1686	33	1685	32	-0.3
TS-28	67	1159	0.1037	1.4	4.2860	3.0	0.2994	1.8	1687	26	1686	29	1687	26	-0.1
TS-28	93	2664	0.1036	1.3	4.3250	3.7	0.3012	2.0	1687	23	1701	28	1687	23	-0.7
TS-28	1	3180	0.1030	1.2	4.3840	2.7	0.3068	2.0	1687	23	1726	29	1687	23	-2.3
TS-28	101	9730	0.1035	0.3	4.2340	2.6	0.2971	1.8	1687.9	5.1	1677	26	1687.9	5.1	0.6
TS-28	43	5978	0.1035	0.8	4.2360	3.1	0.2989	1.9	1688	15	1688	29	1688	15	0.1
TS-28	74	25975	0.1037	0.9	4.1150	2.9	0.2919	2.0	1689	17	1654	28	1689	17	2.1
TS-28	10	5438	0.1034	0.9	4.4170	2.9	0.3104	2.1	1690	16	1743	31	1690	16	-3.1
TS-28	79	14850	0.1037	1.3	4.4550	3.1	0.3117	1.9	1690	11	1749	29	1690	11	-3.5
TS-28	90	5454	0.1037	0.5	4.2940	2.6	0.3004	1.7	1690.8	8.9	1693.1	26	1690.8	8.9	-0.1
TS-28	38	1901	0.1038	2.3	4.3800	4.6	0.3059	2.3	1692	47	1728	31	1692	47	-1.7
TS-28	18	855	0.1040	2.0	4.5500	4.6	0.3153	2.3	1694	41	1768	33	1694	41	-4.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-28	60	19986	0.1039	0.7	4.2110	3.6	0.2946	1.9	1694	12	1662	27	1694	12	1.8
TS-28	23	5700	0.1040	0.7	4.1610	2.9	0.2929	1.9	1695	13	1656	27	1695	13	2.3
TS-28	59	1845	0.1036	2.3	4.4100	4.3	0.3082	2.1	1696	46	1733	31	1696	46	-2.2
TS-28	2	2095	0.1039	0.8	4.3830	3.2	0.3059	1.9	1696	15	1720	28	1696	15	-1.4
TS-28	107	5886	0.1040	0.8	4.3220	3.2	0.2992	2.0	1696	14	1687	30	1696	14	0.5
TS-28	62	7207	0.1046	1.3	4.5050	3.1	0.3123	2.0	1697	15	1752	31	1697	15	-3.2
TS-28	104	10892	0.1041	0.5	4.3210	2.8	0.3012	1.7	1697.8	9.2	1697.3	26	1697.8	9.2	0.0
TS-28	41	1722	0.1041	0.7	4.3480	2.8	0.3030	1.9	1698	12	1706	28	1698	12	-0.5
TS-28	85	5209	0.1042	0.7	4.3930	3.0	0.3059	2.1	1699	12	1718	31	1699	12	-1.2
TS-28	52	2924	0.1042	1.2	4.3830	2.7	0.3046	1.9	1701	20	1715	28	1701	20	-0.8
TS-28	115	3098	0.1042	1.1	4.1400	4.3	0.2875	2.0	1703	18	1632	27	1703	18	4.3
TS-28	110	1523	0.1046	1.6	4.5040	3.3	0.3120	2.0	1704	31	1753	29	1704	31	-2.7
TS-28	76	1310	0.1036	2.3	4.1200	5.1	0.2960	2.6	1706	44	1676	31	1706	44	2.1
TS-28	42	4416	0.1040	2.5	4.2120	3.3	0.2979	2.2	1706	23	1680	33	1706	23	1.5
TS-28	80	4523	0.1045	1.1	4.5590	3.5	0.3140	2.0	1706	22	1761	31	1706	22	-3.2
TS-28	65	4043	0.1046	0.5	4.3100	2.8	0.3001	1.9	1707.6	8.8	1692	28	1707.6	8.8	0.9
TS-28	50	672	0.1045	2.2	4.2800	4.0	0.2999	2.3	1708	42	1691	32	1708	42	1.1
TS-28	75	15390	0.1052	3.8	4.1400	6.3	0.2891	3.0	1712	77	1648	35	1712	77	4.4
TS-28	13	1106	0.1050	1.2	4.2080	3.6	0.2922	2.1	1715	23	1657	29	1715	23	3.7
TS-28	118	2100	0.1050	1.0	4.5980	3.7	0.3173	1.8	1715	20	1778	29	1715	20	-3.7
TS-28	98	1900	0.1053	1.3	4.3430	3.0	0.3009	1.9	1717	24	1703	28	1717	24	1.2
TS-28	82	3352	0.1054	1.1	4.5340	2.9	0.3086	1.9	1718	20	1737	28	1718	20	-0.9
TS-28	88	1506	0.1053	1.2	4.4190	3.4	0.3064	1.9	1719	24	1722	29	1719	24	-0.2
TS-28	36	5429	0.1054	0.5	4.1350	2.9	0.2836	1.8	1721.6	9.2	1609.5	25	1721.6	9.2	6.5
TS-28	109	4336	0.1055	0.9	4.4330	2.7	0.3049	1.8	1725	17	1718	28	1725	17	0.5
TS-28	84	664	0.1054	1.4	4.4700	4.5	0.3045	2.6	1728	30	1708	32	1728	30	0.9
TS-28	69	1231	0.1056	1.2	4.1100	4.1	0.2837	2.3	1729	22	1612	32	1729	22	6.9
TS-28	54	596	0.1061	2.8	4.4800	4.5	0.3115	2.2	1732	56	1756	33	1732	56	-0.9
TS-28	56	113100	0.1073	1.1	4.6050	2.8	0.3135	2.1	1754	13	1757	32	1754	13	-0.2
TS-28	34	1059	0.1079	1.7	4.4400	3.8	0.3025	2.2	1761	31	1701	31	1761	31	3.3
TS-28	6	601	0.1077	1.9	4.6500	3.9	0.3147	2.4	1764	32	1762	34	1764	32	0.1
TS-28	95	19955	0.1080	0.3	4.4840	2.9	0.3023	1.9	1766	5.9	1703	28	1766	5.9	3.6
TS-28	64	1766	0.1084	0.5	4.8120	3.3	0.3236	2.3	1771.3	9.9	1807	36	1771.3	9.9	-2.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-28	57	4244	0.1085	0.7	4.7310	3.2	0.3188	1.9	1772	13	1784	29	1772	13	-0.7
TS-28	1	2866	0.1086	0.6	4.3880	2.7	0.2935	1.9	1774	11	1659	29	1774	11	6.5
TS-28	45	19525	0.1086	0.5	4.4960	2.9	0.2984	2.1	1776.3	8.3	1683	32	1776.3	8.3	5.1
TS-28	35	869	0.1088	1.4	4.3310	3.9	0.2887	2.0	1777	24	1631	30	1777	24	8.0
TS-28	102	123700	0.1088	0.6	4.6520	3.0	0.3120	1.8	1778	11	1750	28	1778	11	1.6
TS-28	103	1133	0.1878	1.8	14.2100	3.4	0.5494	2.2	2739	28	2815	51	2739	28	-3.1
TS-29	62	1624	0.0489	3.3	0.0907	4.2	0.0139	2.0	136	76	89.37	1.6	89.37	1.6	0.1
TS-29	16	433	0.0471	1.4	0.0912	3.3	0.0141	1.9	52	34	90.37	1.7	90.37	1.7	0.1
TS-29	104	1087	0.0474	2.0	0.0913	3.5	0.0142	2.2	65	45	92.2	1.9	92.2	1.9	0.1
TS-29	107	219	0.0471	1.5	0.0916	2.2	0.0143	2.1	53	33	92.7	1.9	92.7	1.9	0.1
TS-29	85	2384	0.0470	1.2	0.0936	2.4	0.0145	1.9	48	27	92.98	1.6	92.98	1.6	0.1
TS-29	15	441	0.0471	1.3	0.0948	3.1	0.0145	2.5	52	30	93.8	2.1	93.8	2.1	0.1
TS-29	96	2430	0.0466	0.9	0.0961	2.4	0.0149	2.6	28	21	97.4	2.4	97.4	2.4	0.1
TS-29	83	230	0.0471	1.8	0.0972	3.1	0.0151	2.6	50	38	99.1	2.3	99.1	2.3	0.1
TS-29	82	174	0.0491	3.3	0.0988	3.4	0.0153	2.7	126	67	99.3	2.3	99.3	2.3	0.1
TS-29	41	89	0.0461	0.0	0.1000	2.2	0.0157	2.3	1.76	0.58	122.9	2.8	122.9	2.8	0.1
TS-29	75	2122	0.0497	3.0	0.1937	6.2	0.0284	2.0	277	67	180.5	3.5	180.5	3.5	34.8
TS-29	40	672	0.0487	2.9	0.1955	4.1	0.0292	2.5	125	63	185.7	4.3	185.7	4.3	0.2
TS-29	115	831	0.0505	4.2	0.2214	5.0	0.0326	2.2	207	96	208.8	4.2	208.8	4.2	0.2
TS-29	5	544	0.0480	2.3	0.2468	3.7	0.0370	2.4	95	50	234.6	5.4	234.6	5.4	0.2
TS-29	91	643	0.0487	2.9	0.2583	4.3	0.0385	2.0	130	64	244.2	4.4	244.2	4.4	0.3
TS-29	30	4836	0.0514	4.1	0.2909	7.2	0.0411	3.2	252	93	260.8	7.7	260.8	7.7	0.3
TS-29	50	1924	0.0483	5.0	0.2734	5.9	0.0410	2.1	105	110	263.7	5.3	263.7	5.3	0.3
TS-29	54	771	0.0484	5.2	0.3000	7.0	0.0454	3.3	107	110	290.6	8.6	290.6	8.6	0.3
TS-29	59	1286	0.0500	3.2	0.3357	4.2	0.0493	2.0	188	75	312.3	6.1	312.3	6.1	0.3
TS-29	19	3416	0.0521	3.8	0.3919	5.6	0.0545	1.8	283	88	342.9	5.8	342.9	5.8	0.4
TS-29	116	695	0.0501	3.6	0.3825	5.2	0.0558	2.2	190	85	355.1	6.8	355.1	6.8	0.4
TS-29	55	1540	0.0542	2.2	0.4379	4.6	0.0592	1.9	378	50	370.7	6.5	370.7	6.5	0.4
TS-29	4	725	0.0485	2.7	0.3850	4.4	0.0570	2.5	115	60	373.9	7.9	373.9	7.9	0.4
TS-29	67	5867	0.0530	3.0	0.4612	4.3	0.0627	1.8	318	72	392.8	6.5	392.8	6.5	0.5
TS-29	112	2294	0.0546	0.9	0.4267	7.0	0.0567	2.3	394	20	394	8.4	394	8.4	0.4
TS-29	102	3238	0.0557	2.7	0.4854	4.7	0.0633	1.9	440	58	396.7	6.4	396.7	6.4	0.5
TS-29	81	3161	0.0570	1.4	0.5006	5.6	0.0640	1.7	487	47	399.6	6.8	399.6	6.8	17.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-29	44	2568	0.0578	4.2	0.5062	6.7	0.0646	1.9	519	92	405.3	6.7	405.3	6.7	0.5
TS-29	58	3040	0.0521	4.0	0.4750	6.3	0.0651	2.2	284	92	406.8	7.7	406.8	7.7	0.5
TS-29	60	22900	0.0543	3.5	0.4930	4.7	0.0660	2.0	378	82	413.6	7.5	413.6	7.5	0.5
TS-29	87	962	0.0549	4.2	0.4970	5.6	0.0665	2.0	406	100	416.8	7.8	416.8	7.8	0.5
TS-29	97	1621	0.0521	4.2	0.4890	7.0	0.0676	2.2	276	97	424.8	7.8	424.8	7.8	0.5
TS-29	113	1923	0.0574	3.3	0.5450	5.5	0.0694	2.0	503	72	435.9	8.3	435.9	8.3	0.5
TS-29	53	5040	0.0580	2.6	0.5510	6.0	0.0701	2.0	521	66	436.9	8.2	436.9	8.2	16.1
TS-29	108	657	0.0561	5.3	0.7580	7.3	0.0968	2.3	439	120	621.2	11	439	120	0.8
TS-29	7	451	0.0525	3.4	0.5290	5.3	0.0719	1.9	300	83	450	7.9	450	7.9	0.5
TS-29	68	1700	0.0553	2.7	0.5640	3.9	0.0734	2.0	418	61	456.9	8.2	456.9	8.2	0.6
TS-29	93	1030	0.0575	3.7	0.8390	5.7	0.1039	2.3	503	85	639.3	13	503	85	0.8
TS-29	109	132	0.0532	4.1	0.5880	8.0	0.0809	4.8	315	97	539	24	539	24	0.6
TS-29	98	6300	0.0584	3.8	0.7270	6.5	0.0883	2.3	543	69	545.1	12	545.1	12	-0.4
TS-29	77	2183	0.0604	3.1	0.7340	5.7	0.0890	1.8	615	69	550.7	9.3	550.7	9.3	0.7
TS-29	51	11397	0.0590	1.4	0.7220	5.5	0.0893	1.7	558	50	551.6	8.7	551.6	8.7	1.1
TS-29	22	3591	0.0602	3.2	0.8250	4.2	0.0992	1.9	605	71	611.5	10	605	71	0.8
TS-29	61	3390	0.0618	2.9	0.9200	4.6	0.1091	2.0	664	65	669.8	12	664	65	0.9
TS-29	27	1402	0.0633	3.5	0.9850	7.5	0.1129	2.9	716	74	716	19	716	74	1.0
TS-29	11	1452	0.0686	5.5	1.1850	9.3	0.1307	2.5	869	120	814	18	869	120	1.2
TS-29	1	450	0.0703	7.5	1.4500	15.9	0.1472	5.6	924	160	913	44	924	160	1.5
TS-29	31	4940	0.0701	3.4	1.4140	6.3	0.1490	3.1	931	72	896	26	931	72	1.4
TS-29	78	4474	0.0704	6.0	1.3520	8.1	0.1400	2.1	935	120	855.5	15	935	120	1.4
TS-29	24	1128	0.0722	3.0	1.6560	5.2	0.1649	2.1	985	62	985	18	985	62	1.7
TS-29	28	14200	0.0730	3.4	1.7850	5.3	0.1756	1.7	1009	68	1044	16	1009	68	1.8
TS-29	119	1048	0.0733	3.0	1.7330	5.5	0.1705	2.1	1022	65	1018	18	1022	65	1.7
TS-29	34	5670	0.0733	3.4	1.6770	5.1	0.1675	1.7	1022	70	998.9	16	1022	70	1.7
TS-29	66	14070	0.0744	3.4	1.8280	6.6	0.1795	2.2	1051	72	1066	20	1051	72	1.8
TS-29	100	825	0.0742	2.7	1.6620	4.7	0.1646	2.1	1058	52	986	18	1058	52	1.7
TS-29	13	22760	0.0753	1.7	2.0040	5.5	0.1897	1.7	1075	44	1119.6	18	1075	44	-4.1
TS-29	110	10670	0.0753	4.4	1.8640	7.0	0.1778	2.1	1083	78	1055	21	1083	78	2.6
TS-29	94	1562	0.0756	3.7	1.9780	6.1	0.1903	2.1	1084	80	1121	20	1084	80	2.0
TS-29	73	607	0.0769	4.7	1.8930	7.4	0.1833	2.3	1096	99	1088	21	1096	99	1.9
TS-29	71	928	0.0764	3.5	1.7880	5.6	0.1720	2.1	1100	72	1030	18	1100	72	1.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-29	111	4166	0.0775	3.9	1.9760	7.6	0.1848	2.2	1133	77	1133	21	1133	77	2.0
TS-29	52	17680	0.0777	3.1	2.0280	6.4	0.1928	1.8	1140	65	1135.3	18	1140	65	2.0
TS-29	65	2019	0.0780	3.6	1.9310	6.2	0.1824	1.9	1141	74	1084.9	17	1141	74	1.9
TS-29	117	3688	0.0777	3.6	1.8140	6.1	0.1739	2.3	1141	80	1040	19	1141	80	1.8
TS-29	33	5645	0.0778	2.8	2.1580	6.0	0.1982	2.1	1162	61	1165	22	1162	61	-0.3
TS-29	26	2277	0.0789	3.4	2.1310	5.2	0.1954	1.8	1165	68	1150.1	18	1165	68	2.1
TS-29	9	7156	0.0806	5.3	2.0490	9.3	0.1853	2.5	1208	110	1100	23	1208	110	2.0
TS-29	25	603	0.0804	3.4	2.0780	5.3	0.1912	2.0	1215	69	1134	20	1215	69	2.1
TS-29	42	2821	0.0808	4.2	2.2670	6.6	0.2078	1.9	1215	80	1214	21	1215	80	2.3
TS-29	49	3917	0.0811	7.5	2.1050	9.0	0.1877	2.5	1221	150	1221	25	1221	150	2.1
TS-29	72	545	0.0817	4.3	1.9720	6.6	0.1851	2.7	1229	84	1118	24	1229	84	2.0
TS-29	32	7113	0.0828	2.9	2.6000	5.8	0.2259	1.7	1262	56	1312.9	20	1262	56	2.6
TS-29	8	710	0.0848	7.8	2.4500	12.2	0.2112	2.4	1295	160	1276	21	1295	160	2.5
TS-29	48	4796	0.0846	1.3	2.7520	5.5	0.2372	1.8	1313	45	1372	22	1313	45	-4.5
TS-29	89	1958	0.0853	3.0	2.5460	5.5	0.2162	1.8	1321	59	1262	20	1321	59	2.5
TS-29	23	4524	0.0853	3.4	2.6620	6.0	0.2238	2.2	1321	66	1303	25	1321	66	2.7
TS-29	35	22740	0.0885	1.1	2.9670	5.4	0.2422	1.9	1392	49	1398	23	1392	49	-0.4
TS-29	105	6683	0.0887	3.8	2.9040	6.5	0.2364	1.7	1405	73	1365	21	1405	73	2.9
TS-29	88	2381	0.0893	3.6	2.9460	5.4	0.2414	1.9	1412	64	1396	24	1412	64	2.9
TS-29	90	8743	0.0896	3.0	2.8940	5.5	0.2338	1.7	1415	57	1354.7	21	1415	57	2.9
TS-29	86	3304	0.0901	5.5	3.0100	8.6	0.2449	2.5	1419	100	1413	27	1419	100	3.0
TS-29	20	16780	0.0900	4.1	2.7880	6.5	0.2293	2.2	1429	85	1339	22	1429	85	2.8
TS-29	92	10725	0.0914	2.8	3.3390	6.0	0.2635	1.7	1454	53	1506	23	1454	53	3.3
TS-29	18	374	0.0918	4.9	3.1300	8.0	0.2490	2.3	1461	100	1442	27	1461	100	3.1
TS-29	70	5078	0.0929	4.6	3.4480	6.4	0.2695	1.7	1486	86	1540	24	1486	86	3.4
TS-29	101	37333	0.0957	1.1	3.3800	5.3	0.2549	1.7	1543	46	1463.8	22	1543	46	5.1
TS-29	56	1516	0.0961	3.2	3.3540	6.0	0.2582	1.9	1546	61	1480	25	1546	61	3.4
TS-29	103	3186	0.0973	3.2	3.6400	5.5	0.2698	1.7	1578	59	1539	23	1578	59	3.6
TS-29	37	33900	0.0989	2.8	3.8070	6.8	0.2802	2.4	1602	52	1595	32	1602	52	3.8
TS-29	3	3458	0.0992	2.7	4.0070	5.2	0.2893	1.8	1607	50	1637	24	1607	50	4.0
TS-29	17	4212	0.1000	2.2	4.1560	5.8	0.2958	1.7	1623	47	1670	25	1623	47	-2.9
TS-29	76	2582	0.1014	4.0	3.8800	5.9	0.2773	2.1	1652	77	1579	28	1652	77	3.9
TS-29	57	1625	0.1022	3.7	3.9100	7.4	0.2820	2.1	1659	66	1601	28	1659	66	3.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-29	14	2537	0.1022	3.9	3.7380	5.6	0.2663	1.8	1661	72	1525	24	1661	72	3.7
TS-29	63	5780	0.1025	3.4	4.2180	5.7	0.2997	1.8	1671	59	1687	27	1671	59	4.2
TS-29	99	882	0.1031	3.9	4.1480	6.3	0.2903	2.0	1677	71	1644	26	1677	71	4.1
TS-29	64	1155	0.1046	5.1	4.2300	8.3	0.3003	2.3	1700	100	1698	30	1700	100	4.2
TS-29	39	5352	0.1047	2.2	4.3970	5.7	0.3033	1.8	1708	40	1707	26	1708	40	4.4
TS-29	74	1748	0.1042	4.3	4.1650	6.2	0.2938	1.7	1717	84	1663	26	1717	84	4.2
TS-29	69	23620	0.1066	0.8	4.7280	5.5	0.3241	1.6	1744.5	45	1809.8	25	1744.5	45	-3.7
TS-29	38	613	0.1089	6.6	4.6600	11.8	0.3109	2.7	1773	130	1739	35	1773	130	4.7
TS-29	84	5473	0.1084	4.2	4.3060	7.0	0.2881	1.8	1779	82	1636	26	1779	82	4.3
TS-29	47	2117	0.1096	3.3	4.8980	5.7	0.3226	1.9	1797	56	1804	27	1797	56	4.9
TS-29	106	14133	0.1100	1.2	4.7770	5.4	0.3134	1.9	1805	41	1757	29	1805	41	2.7
TS-29	36	2638	0.1199	3.0	6.0010	6.0	0.3627	1.8	1956	52	1992	29	1956	52	6.0
TS-29	6	1083	0.1220	3.2	6.0300	6.5	0.3552	2.0	1985	56	1963	33	1985	56	6.0
TS-29	95	4962	0.1741	3.0	12.5200	5.8	0.5169	1.6	2600.4	45	2686	36	2600.4	45	12.5
TS-29	21	3237	0.1881	4.5	13.2500	6.0	0.5070	1.7	2726	72	2640	37	2726	72	13.3
TS-29	12	1133	0.2322	3.7	18.9300	6.3	0.5871	2.0	3066	59	2982	45	3066	59	18.9
TS-29	118	28233	0.2494	3.2	22.0200	5.9	0.6354	1.7	3181.9	49	3172	42	3181.9	49	22.0
TS-30	69	1890	0.0467	1.3	0.0882	2.8	0.0137	3.1	30	28	88.4	2.5	88.4	2.5	-192.7
TS-30	116	965	0.0478	1.9	0.0979	2.6	0.0151	2.8	84	43	97.8	2.5	97.8	2.5	-15.2
TS-30	8	4008	0.0504	3.2	0.1077	4.7	0.0154	2.5	246	57	98.5	2.4	98.5	2.4	60.0
TS-30	50	391	0.0469	1.6	0.1023	2.8	0.0160	3.1	41	37	103	3.1	103	3.1	-148.8
TS-30	101	23000	0.0504	4.0	0.1622	5.1	0.0233	2.6	283	68	148.6	3.9	148.6	3.9	47.5
TS-30	31	1219	0.0476	1.7	0.1617	2.8	0.0245	2.8	75	39	156	4.1	156	4.1	-107.6
TS-30	87	388	0.0530	4.1	0.3560	7.6	0.0483	5.8	329	93	329	18	329	18	7.6
TS-30	89	717	0.0518	5.2	0.4220	6.2	0.0598	3.0	259	120	381.8	9	381.8	9	-44.6
TS-30	34	1314	0.0602	3.2	0.7820	4.1	0.0956	2.8	612	68	592.8	14	612	68	3.9
TS-30	48	2075	0.0606	5.3	0.8110	6.8	0.0969	4.3	625	120	625	25	625	120	4.2
TS-30	102	1491	0.0607	3.5	0.7970	6.3	0.0951	3.3	628	71	624	19	628	71	6.8
TS-30	115	906	0.0611	1.2	0.8560	4.3	0.1014	2.6	640.7	26	638.7	15	640.7	26	2.9
TS-30	71	553	0.0615	8.5	0.9110	7.1	0.1082	4.2	648	180	699	26	648	180	-2.2
TS-30	55	488	0.0623	1.6	0.8820	4.4	0.1024	3.3	684	35	684	22	684	35	8.2
TS-30	46	4775	0.0630	4.0	0.8780	5.2	0.1028	2.7	701	87	635.7	15	701	87	9.9
TS-30	64	809	0.0653	2.1	1.0890	4.0	0.1229	2.8	786	48	748	18	786	48	5.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-30	58	1856	0.0660	3.3	1.1410	6.5	0.1254	3.0	805	71	801	22	805	71	5.2
TS-30	45	1174	0.0696	8.0	1.3550	8.9	0.1405	4.7	906	150	888	36	906	150	6.6
TS-30	68	1326	0.0721	6.9	1.6000	11.3	0.1574	5.2	980	130	981	43	980	130	4.0
TS-30	74	63150	0.0752	2.3	1.8590	3.9	0.1794	2.3	1076	44	1063.7	22	1076	44	1.2
TS-30	78	3079	0.0766	3.0	1.9180	5.0	0.1819	2.5	1113	58	1113	24	1113	58	3.2
TS-30	90	3319	0.0772	2.9	1.8820	3.8	0.1789	2.2	1131	62	1061.8	22	1131	62	6.2
TS-30	9	1402	0.0832	4.6	2.3450	5.1	0.2070	2.9	1269	85	1228	26	1269	85	4.4
TS-30	25	2266	0.0832	1.7	2.4520	5.3	0.2141	3.1	1274	32	1283	28	1274	32	1.9
TS-30	18	1747	0.0847	7.9	2.1310	8.4	0.1810	3.3	1301	160	1105	29	1301	160	17.6
TS-30	113	1894	0.0872	4.2	2.6530	6.0	0.2191	2.9	1376	84	1279	30	1376	84	7.2
TS-30	42	7700	0.0888	2.0	2.8780	3.8	0.2365	2.2	1400	39	1367.7	28	1400	39	2.2
TS-30	61	68500	0.0891	1.1	3.1260	4.2	0.2502	2.4	1405	38	1439	31	1405	38	-2.4
TS-30	10	2158	0.0896	1.3	3.0960	3.9	0.2480	2.3	1420	41	1428	30	1420	41	-0.6
TS-30	66	6553	0.0899	2.4	3.0520	3.6	0.2475	2.4	1422	46	1426	30	1422	46	-0.3
TS-30	86	4105	0.0901	3.2	3.1560	3.5	0.2590	2.7	1427	63	1485	36	1427	63	-4.0
TS-30	111	3771	0.0898	1.8	3.0720	4.6	0.2498	3.0	1429	53	1437	39	1429	53	-0.6
TS-30	5	972	0.0907	3.9	3.1450	4.8	0.2468	2.4	1441	78	1424	30	1441	78	1.3
TS-30	4	1400	0.0939	3.7	3.0370	4.9	0.2395	2.8	1501	71	1392	29	1501	71	7.8
TS-30	99	305	0.1004	6.0	3.5000	7.7	0.2570	3.3	1624	120	1496	40	1624	120	9.2
TS-30	110	3171	0.1010	5.5	3.5100	7.4	0.2548	2.7	1641	110	1477	33	1641	110	10.8
TS-30	11	7380	0.1010	2.4	4.2110	3.6	0.2986	2.3	1641	45	1687.3	33	1641	45	-2.6
TS-30	21	4142	0.1016	2.3	4.0440	3.7	0.2901	2.2	1652	42	1642	32	1652	42	0.6
TS-30	30	1678	0.1015	3.1	4.1770	5.0	0.2957	2.4	1653	63	1668	34	1653	63	-1.0
TS-30	40	1996	0.1019	5.7	3.6710	5.4	0.2617	2.5	1659	110	1518	32	1659	110	9.7
TS-30	79	2097	0.1023	2.8	4.2600	4.5	0.2991	2.7	1665	52	1686	40	1665	52	-1.3
TS-30	63	15567	0.1025	1.6	4.2410	4.0	0.3005	2.3	1666	49	1693	34	1666	49	-1.6
TS-30	24	9095	0.1025	2.4	4.2060	3.8	0.2969	2.3	1669	46	1677.5	33	1669	46	-0.4
TS-30	29	9173	0.1026	0.8	4.4870	3.8	0.3154	2.4	1674.5	40	1767	37	1674.5	40	-5.5
TS-30	82	4957	0.1031	4.7	4.2800	5.1	0.3013	2.7	1675	90	1698	38	1675	90	-1.3
TS-30	81	4668	0.1029	2.3	4.2880	4.0	0.2988	2.3	1676	43	1683	35	1676	43	-0.5
TS-30	33	6720	0.1030	2.6	4.2460	4.0	0.2976	2.4	1678	49	1680	34	1678	49	-0.1
TS-30	84	1619	0.1033	3.5	4.3130	4.6	0.3007	2.5	1679	75	1696	37	1679	75	-0.9
TS-30	118	4100	0.1031	2.6	4.2140	4.5	0.2957	2.3	1680	48	1669	34	1680	48	0.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-30	114	1909	0.1032	2.4	4.1700	5.0	0.2948	3.4	1681	45	1664	49	1681	45	1.0
TS-30	67	2255	0.1034	3.4	3.9820	5.0	0.2822	2.5	1683	64	1604	35	1683	64	4.8
TS-30	52	3394	0.1032	3.1	4.3830	4.8	0.3041	2.3	1683	60	1710	34	1683	60	-1.8
TS-30	88	5828	0.1034	2.6	4.2020	4.0	0.2954	2.3	1686	48	1668	34	1686	48	1.1
TS-30	83	17760	0.1035	2.1	4.0230	4.2	0.2858	2.3	1689	41	1620	33	1689	41	4.1
TS-30	108	7944	0.1036	2.2	4.2510	4.0	0.2944	2.4	1689.2	41	1661.5	33	1689.2	41	1.5
TS-30	49	5538	0.1036	2.5	4.6290	3.9	0.3209	2.3	1689.3	47	1794	36	1689.3	47	-6.2
TS-30	109	3424	0.1038	3.2	4.1220	3.9	0.2914	2.5	1691	59	1648	35	1691	59	2.5
TS-30	36	2964	0.1038	2.8	4.3720	4.1	0.3024	2.3	1692	51	1703	35	1692	51	-0.7
TS-30	28	71825	0.1035	0.6	4.2970	4.0	0.3009	2.4	1692.9	37	1695	35	1692.9	37	-0.1
TS-30	95	7638	0.1032	1.1	4.2680	3.7	0.2990	2.3	1693	38	1686	34	1693	38	0.4
TS-30	73	5708	0.1039	2.4	4.2370	4.7	0.2989	2.6	1694	44	1687	38	1694	44	0.5
TS-30	80	34050	0.1040	2.8	4.2000	4.0	0.2940	2.3	1695	51	1662	34	1695	51	1.9
TS-30	19	5250	0.1038	2.4	4.3470	4.1	0.3016	2.3	1700	50	1699	34	1700	50	0.1
TS-30	97	16300	0.1043	2.7	3.8530	3.6	0.2678	2.4	1700	49	1531	32	1700	49	10.0
TS-30	16	15521	0.1042	2.3	4.3580	4.1	0.3009	2.2	1700.6	43	1695.6	33	1700.6	43	0.3
TS-30	98	11300	0.1043	2.4	4.3770	3.9	0.3032	2.3	1700.7	45	1707	34	1700.7	45	-0.4
TS-30	39	4406	0.1045	1.1	4.2080	3.8	0.2905	2.3	1703	38	1644	33	1703	38	3.5
TS-30	41	2077	0.1050	3.2	4.3440	4.8	0.3033	2.7	1711	60	1711	41	1711	60	0.2
TS-30	100	5025	0.1054	1.6	4.5810	4.1	0.3203	2.5	1712	45	1791	39	1712	45	-4.6
TS-30	85	2020	0.1050	2.6	4.3440	4.4	0.2987	2.5	1713	48	1686	37	1713	48	1.7
TS-30	106	2562	0.1050	2.5	4.3330	3.7	0.3028	2.4	1714	46	1705	36	1714	46	0.5
TS-30	44	3392	0.1052	3.3	3.9510	4.8	0.2753	2.6	1714	61	1571	34	1714	61	8.5
TS-30	22	1115	0.1051	3.4	4.5600	5.3	0.3103	2.8	1717	61	1743	42	1717	61	-1.7
TS-30	120	3189	0.1053	3.4	4.5790	4.8	0.3145	2.4	1718	62	1762	36	1718	62	-2.6
TS-30	12	8687	0.1056	2.5	4.4280	4.1	0.3036	2.3	1725	45	1709	34	1725	45	0.9
TS-30	72	3631	0.1058	2.8	4.5670	4.4	0.3121	2.6	1726	53	1752	40	1726	53	-1.4
TS-30	23	27400	0.1058	2.5	4.2150	4.3	0.2899	2.4	1727.7	46	1644.7	32	1727.7	46	5.0
TS-30	75	3153	0.1064	1.6	4.2920	4.2	0.2868	2.9	1729	50	1625	41	1729	50	6.0
TS-30	103	1941	0.1056	4.5	3.8530	5.5	0.2694	2.4	1731	85	1539	32	1731	85	11.1
TS-30	96	2282	0.1058	4.1	4.6420	5.2	0.3147	2.4	1731	80	1768	36	1731	80	-1.9
TS-30	17	1288	0.1061	3.3	4.4170	4.3	0.3023	2.6	1732	60	1709	36	1732	60	1.7
TS-30	104	8813	0.1053	1.3	4.6380	3.9	0.3186	2.3	1733	37	1783	36	1733	37	-2.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-30	60	8453	0.1071	3.0	4.7000	5.3	0.3174	2.6	1749	55	1777	39	1749	55	-1.7
TS-30	92	1375	0.1072	2.7	4.3330	3.7	0.2968	2.5	1752	51	1682	34	1752	51	4.3
TS-30	117	41683	0.1071	1.0	4.5910	3.7	0.3122	2.2	1752.7	36	1751.4	34	1752.7	36	0.1
TS-30	70	1672	0.1073	2.2	4.4670	3.8	0.3006	2.4	1753	41	1696	34	1753	41	3.4
TS-30	37	1799	0.1083	2.4	4.6420	3.9	0.3087	2.5	1770	44	1737	36	1770	44	2.0
TS-30	26	1236	0.1095	2.6	4.4480	4.3	0.2987	2.5	1794	50	1687	35	1794	50	6.1
TS-30	76	8363	0.1104	1.0	5.1190	3.9	0.3337	2.4	1807.1	39	1856	39	1807.1	39	-2.7
TS-31	75	127	0.0466	0.8	0.0967	2.4	0.0151	3.1	27	17	96.6	2.8	96.6	2.8	-257.8
TS-31	42	265	0.0467	1.2	0.0959	3.8	0.0149	4.5	31	27	97.3	4	97.3	4	-207.4
TS-31	104	495	0.0507	5.1	0.1078	5.5	0.0154	2.9	354	59	98.6	2.9	98.6	2.9	72.1
TS-31	19	202	0.0466	2.0	0.0938	3.6	0.0147	4.1	4.3	3.8	100	3.6	100	3.6	-2086.0
TS-31	49	125	0.0505	13.1	0.1110	13.5	0.0160	3.9	600	100	102.2	4	102.2	4	83.0
TS-31	112	97	0.0504	10.3	0.1140	11.4	0.0160	4.1	450	110	102.5	4.1	102.5	4.1	77.2
TS-31	108	162	0.0572	6.8	0.1281	6.7	0.0161	3.0	580	83	103.1	3	103.1	3	82.2
TS-31	31	800	0.0499	3.0	0.1487	4.1	0.0226	3.5	177	70	145.5	4.8	145.5	4.8	18.6
TS-31	10	5840	0.0524	7.1	0.1740	7.5	0.0237	2.9	431	68	150.7	4.4	150.7	4.4	65.0
TS-31	85	81	0.0471	1.3	0.1521	2.8	0.0236	3.5	45	26	154	4.9	154	4.9	-234.4
TS-31	36	3797	0.0475	1.1	0.1587	2.1	0.0241	2.6	71	24	154	3.7	154	3.7	-116.5
TS-31	120	452	0.0490	2.4	0.1889	3.1	0.0283	3.1	140	53	180.8	5	180.8	5	-28.6
TS-31	3	310	0.0482	1.3	0.1772	5.6	0.0269	3.3	107	32	185.7	5.3	185.7	5.3	-59.8
TS-31	14	3683	0.0553	0.9	0.5000	6.2	0.0652	5.1	424	19	424	21	424	21	4.0
TS-31	56	9847	0.0576	0.9	0.6100	3.9	0.0761	2.8	513	19	490	11	490	11	7.8
TS-31	88	677	0.0551	2.4	0.6300	3.7	0.0826	3.1	405	56	511.9	14	511.9	14	-26.2
TS-31	74	1808	0.0597	0.7	0.6810	2.9	0.0831	2.4	591	14	515.2	12	515.2	12	12.9
TS-31	107	1966	0.0616	1.9	0.8600	9.0	0.1023	7.0	654	42	654	44	654	42	4.3
TS-31	27	597	0.0617	2.1	0.8740	9.6	0.1036	7.5	655	46	671	47	655	46	3.2
TS-31	86	3672	0.0628	0.5	0.9640	3.3	0.1112	2.6	700	10	694.8	17	700	10	2.9
TS-31	72	1610	0.0641	1.2	1.0210	6.3	0.1175	4.1	749	24	749	28	749	24	4.4
TS-31	46	1096	0.0651	1.7	1.1260	6.0	0.1273	6.0	773	38	805	44	773	38	0.3
TS-31	101	2139	0.0692	1.4	1.3680	6.0	0.1426	4.2	900	28	900	34	900	28	4.6
TS-31	94	1934	0.0702	1.1	1.4420	4.9	0.1485	3.5	931	22	931	29	931	22	4.2
TS-31	115	615	0.0709	1.7	1.4720	6.8	0.1495	4.7	952	35	952	40	952	35	5.8
TS-31	77	820	0.0725	1.4	1.5960	6.2	0.1569	3.5	997	27	987	31	997	27	5.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-31	89	2432	0.0727	1.3	1.6090	5.3	0.1638	3.4	1001	26	1018	29	1001	26	2.3
TS-31	17	1602	0.0727	1.2	1.6280	5.0	0.1660	4.4	1002	23	1021	36	1002	23	1.3
TS-31	105	1643	0.0734	2.5	1.6800	8.9	0.1643	5.5	1031	57	1010	48	1031	57	5.0
TS-31	60	1501	0.0798	0.7	2.2250	2.9	0.2024	2.4	1192	14	1192.4	25	1192	14	0.3
TS-31	97	1854	0.0816	1.2	2.3110	4.8	0.2046	3.2	1232	25	1232	35	1232	25	2.7
TS-31	57	2177	0.0883	1.5	3.0760	3.0	0.2544	2.3	1380	17	1461	30	1380	17	-5.9
TS-31	26	4636	0.0881	1.0	2.9530	2.7	0.2424	2.2	1384	12	1399.3	28	1384	12	-1.1
TS-31	47	8191	0.0881	0.8	2.9980	2.9	0.2458	2.2	1384	15	1416.6	28	1384	15	-2.4
TS-31	22	8839	0.0881	0.5	2.8560	2.6	0.2356	2.3	1384.2	9.7	1364.2	28	1384.2	9.7	1.5
TS-31	8	3188	0.0881	1.5	2.8730	3.8	0.2369	2.4	1389	28	1371	29	1389	28	1.4
TS-31	23	3727	0.0885	1.5	3.0120	3.2	0.2448	2.7	1390	28	1403	29	1390	28	-1.5
TS-31	45	2631	0.0883	1.1	2.9290	3.4	0.2409	2.2	1391	21	1390	29	1391	21	0.0
TS-31	65	14338	0.0886	0.6	3.1440	2.6	0.2555	2.4	1394	12	1466.3	29	1394	12	-5.2
TS-31	92	49767	0.0887	0.8	2.9450	2.7	0.2406	2.3	1398.8	9.5	1389.5	28	1398.8	9.5	0.7
TS-31	79	7118	0.0891	1.8	3.1720	4.4	0.2573	2.6	1400	36	1477	33	1400	36	-5.4
TS-31	109	5076	0.0892	0.6	3.0870	2.8	0.2520	2.2	1407	12	1446.8	29	1407	12	-3.0
TS-31	24	9847	0.0892	0.8	2.8140	3.5	0.2323	2.8	1409	15	1347	34	1409	15	4.5
TS-31	113	3345	0.0896	0.7	3.0930	3.6	0.2559	2.9	1415	13	1470	38	1415	13	-3.7
TS-31	93	21260	0.0911	2.2	3.3110	4.2	0.2611	2.5	1441	41	1494	32	1441	41	-3.7
TS-31	117	954	0.0913	1.6	2.9400	3.3	0.2378	2.5	1448	30	1379	29	1448	30	5.0
TS-31	61	1277	0.0914	1.1	3.3070	2.8	0.2610	2.3	1460	21	1495	31	1460	21	-2.4
TS-31	50	18825	0.0921	1.2	3.1780	2.8	0.2513	2.4	1467	22	1445	30	1467	22	1.5
TS-31	13	31067	0.1014	1.0	4.1430	2.7	0.2962	2.3	1648	19	1670	34	1648	19	-1.5
TS-31	81	350000	0.1022	1.5	4.1780	3.1	0.2979	2.5	1661	26	1678	35	1661	26	-1.2
TS-31	18	17460	0.1023	1.1	4.1440	3.4	0.2912	2.3	1666	20	1650	35	1666	20	1.1
TS-31	51	10214	0.1024	0.5	4.1000	2.7	0.2897	2.3	1668.1	9	1640.1	33	1668.1	9	1.7
TS-31	118	6247	0.1025	0.6	4.1870	2.9	0.2957	2.3	1669	12	1671.2	33	1669	12	-0.1
TS-31	70	19460	0.1024	1.1	4.1340	2.7	0.2936	2.3	1669	14	1659	34	1669	14	0.6
TS-31	100	1513	0.1026	0.8	3.9640	3.0	0.2817	2.3	1670	14	1600	32	1670	14	4.2
TS-31	37	7460	0.1023	0.8	3.8950	2.8	0.2783	2.6	1672.8	7.3	1582	37	1672.8	7.3	5.4
TS-31	64	2031	0.1028	0.8	4.2800	2.8	0.3011	2.3	1674	15	1701	34	1674	15	-1.4
TS-31	25	24544	0.1029	0.5	4.0920	2.7	0.2893	2.2	1676.4	9.7	1638	32	1676.4	9.7	2.3
TS-31	11	18090	0.1028	0.5	4.3040	2.6	0.3041	2.2	1676.8	9.3	1711.5	33	1676.8	9.3	-2.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-31	2	7413	0.1029	1.5	4.1690	2.9	0.2958	2.3	1677	17	1670.3	33	1677	17	0.4
TS-31	33	2791	0.1026	1.7	4.1280	2.9	0.2918	2.3	1679	17	1650	33	1679	17	1.7
TS-31	20	9024	0.1030	1.1	4.2410	2.6	0.2982	2.4	1680	19	1683	35	1680	19	-0.1
TS-31	114	128500	0.1029	0.8	4.4040	2.7	0.3107	2.5	1681.1	8	1744	39	1681.1	8	-3.7
TS-31	9	2674	0.1033	0.8	4.2400	2.8	0.2970	2.3	1683	15	1677.5	33	1683	15	0.4
TS-31	62	12460	0.1036	1.3	4.2920	2.8	0.3012	2.3	1683	15	1696.9	34	1683	15	-0.8
TS-31	76	2355	0.1032	1.0	4.1060	3.4	0.2891	2.4	1685	17	1641	33	1685	17	2.8
TS-31	99	3583	0.1035	0.9	4.1790	3.1	0.2934	2.5	1686	17	1657	37	1686	17	1.7
TS-31	83	18920	0.1035	0.8	4.3620	3.0	0.3076	2.4	1686	15	1727	35	1686	15	-2.6
TS-31	82	1627	0.1037	1.5	4.1090	3.2	0.2914	2.4	1689	28	1649	35	1689	28	2.4
TS-31	39	22240	0.1036	0.5	4.3080	2.6	0.3001	2.2	1689	8.4	1692.9	33	1689	8.4	-0.2
TS-31	116	1054	0.1036	1.4	4.3750	3.0	0.3058	2.4	1691	26	1720	35	1691	26	-1.7
TS-31	6	10652	0.1038	1.3	4.2170	3.1	0.2965	2.6	1691	24	1675	35	1691	24	1.0
TS-31	29	3824	0.1038	0.7	4.1080	2.7	0.2887	2.3	1693	13	1637	31	1693	13	3.4
TS-31	71	8377	0.1039	1.1	4.3330	2.8	0.3041	2.4	1693	11	1712	35	1693	11	-1.1
TS-31	103	9841	0.1037	0.5	4.2510	2.6	0.2974	2.3	1693	9.4	1678	34	1693	9.4	0.9
TS-31	44	1971	0.1039	0.6	4.2660	2.8	0.2982	2.4	1695	12	1681	33	1695	12	0.8
TS-31	111	2384	0.1040	0.4	4.2790	2.6	0.3003	2.2	1697.3	7.8	1692.6	33	1697.3	7.8	0.3
TS-31	43	5022	0.1042	0.5	4.2970	3.0	0.3002	2.5	1699.4	8.6	1692	37	1699.4	8.6	0.4
TS-31	41	3243	0.1043	1.0	4.4140	3.2	0.3048	2.5	1700	19	1715	36	1700	19	-0.9
TS-31	95	2439	0.1044	0.9	4.1560	3.6	0.2928	2.4	1702	16	1653	36	1702	16	2.8
TS-31	80	1337	0.1045	0.7	4.4030	2.7	0.3042	2.4	1704	13	1712	36	1704	13	-0.5
TS-31	102	5086	0.1046	1.4	4.4190	2.9	0.3100	2.4	1706	11	1740	36	1706	11	-2.0
TS-31	73	707	0.1041	2.8	4.6800	3.6	0.3259	2.7	1707	28	1818	43	1707	28	-6.5
TS-31	91	8542	0.1049	1.3	4.0970	3.2	0.2865	2.5	1709	25	1623	34	1709	25	5.0
TS-31	66	2606	0.1052	0.7	4.3820	3.0	0.3023	2.3	1717	13	1705	36	1717	13	0.9
TS-31	58	1677	0.1048	2.0	4.2500	4.0	0.2911	2.5	1724	38	1648	37	1724	38	4.5
TS-31	15	2749	0.1060	0.5	4.5030	2.7	0.3086	2.3	1730.3	8.3	1734	34	1730.3	8.3	-0.3
TS-31	87	1903	0.1061	1.1	4.3160	3.7	0.2955	2.6	1736	22	1667	38	1736	22	3.9
TS-31	35	2468	0.1072	0.7	4.4040	3.6	0.2971	2.5	1752	13	1682	36	1752	13	4.3
TS-31	98	7808	0.1078	0.7	4.8000	4.4	0.3251	3.4	1762	13	1810	52	1762	13	-2.8
TS-31	106	3110	0.1079	0.6	4.3750	3.2	0.2959	2.4	1763	11	1674	35	1763	11	5.1
TS-31	38	598	0.1103	2.1	4.4300	3.6	0.2993	2.7	1800	38	1696	37	1800	38	6.2

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-31	4	746	0.1106	3.3	4.7100	4.9	0.3170	3.2	1800	60	1778	45	1800	60	1.4
TS-31	48	11572	0.1738	0.6	11.8300	2.6	0.4944	2.2	2597.3	8.9	2590	48	2597.3	8.9	0.3
TS-32	91	3028	0.0469	1.5	0.0858	3.7	0.0134	2.8	43	34	85.9	2.2	85.9	2.2	-99.5
TS-32	79	496	0.0471	1.7	0.1109	4.2	0.0171	3.3	53	38	109.9	3.1	109.9	3.1	-106.0
TS-32	117	1180	0.0491	3.9	0.1449	6.9	0.0220	2.6	146	87	140.9	3.4	140.9	3.4	4.1
TS-32	23	262	0.0461	0.2	0.1472	3.4	0.0230	3.1	4	5.4	159.1	5.1	159.1	5.1	-3560.0
TS-32	52	183	0.0466	0.9	0.1775	3.3	0.0276	3.3	25	21	181.3	5.8	181.3	5.8	-601.2
TS-32	66	313	0.0516	0.5	0.2801	4.6	0.0393	2.8	269.8	11	269.8	7.4	269.8	7.4	7.9
TS-32	39	338	0.0481	2.3	0.3186	4.1	0.0488	2.9	98	50	312.2	8.7	312.2	8.7	-213.1
TS-32	43	1072	0.0541	1.5	0.4222	9.0	0.0567	2.8	375.9	34	377.2	10	377.2	10	5.4
TS-32	105	1036	0.0547	2.9	0.4500	9.3	0.0593	3.4	397.5	63	393.1	12	393.1	12	6.6
TS-32	10	727	0.0548	1.0	0.4649	8.2	0.0615	2.6	403.9	23	403.9	9.8	403.9	9.8	4.7
TS-32	32	311	0.0549	0.6	0.4531	5.5	0.0597	2.7	408.7	13	407.7	9.9	407.7	9.9	8.5
TS-32	38	1145	0.0553	1.7	0.4984	8.2	0.0653	2.6	424.7	39	424.7	10	424.7	10	4.0
TS-32	116	627	0.0542	3.5	0.5160	6.4	0.0684	3.1	368	81	427.8	12	427.8	12	-16.0
TS-32	21	996	0.0570	1.6	0.5720	9.3	0.0728	2.6	489.7	35	489.7	12	489.7	12	7.5
TS-32	64	2402	0.0580	3.4	0.6490	10.2	0.0809	3.7	529	74	529	18	529	18	5.3
TS-32	27	852	0.0587	1.3	0.6870	14.0	0.0848	2.9	557.4	28	557.4	14	557.4	28	5.6
TS-32	71	403	0.0599	3.7	0.7510	9.6	0.0904	4.0	599	77	599	23	599	77	7.0
TS-32	9	412	0.0605	3.6	0.7950	8.4	0.0959	2.8	619	77	591.3	14	619	77	4.7
TS-32	81	1763	0.0610	3.9	0.8420	10.9	0.1002	3.7	642	84	642	22	642	84	4.2
TS-32	51	3082	0.0640	3.9	1.0260	10.7	0.1158	3.5	740	83	740	24	740	83	4.6
TS-32	48	1271	0.0654	3.7	1.1100	14.4	0.1222	2.9	787	74	781	21	787	74	5.6
TS-32	96	1267	0.0675	2.4	1.2510	12.0	0.1343	2.6	854.2	48	854.2	20	854.2	48	4.9
TS-32	74	1058	0.0701	21.4	1.4100	22.7	0.1390	9.4	896	380	862	72	896	380	7.5
TS-32	6	2061	0.0712	12.2	1.5290	13.7	0.1536	4.7	955	250	955	40	955	250	3.8
TS-32	72	1197	0.0721	1.1	1.5830	6.1	0.1587	2.6	988.2	23	988.9	22	988.2	23	3.8
TS-32	57	2699	0.0750	3.5	1.8060	11.6	0.1751	2.6	1067.5	68	1069.2	23	1067.5	68	2.6
TS-32	83	3814	0.0761	3.7	1.8770	11.2	0.1787	2.7	1097	74	1097	27	1097	74	3.4
TS-32	111	8513	0.0761	2.8	1.9250	8.8	0.1849	2.3	1097	54	1092.2	23	1097	54	0.3
TS-32	46	3019	0.0778	1.2	2.1500	8.8	0.1968	2.4	1129	50	1158.2	25	1129	50	-2.6
TS-32	36	1454	0.0775	3.7	1.9970	9.0	0.1855	2.4	1133	73	1097	25	1133	73	3.2
TS-32	3	1076	0.0780	6.3	2.1780	13.3	0.2000	3.6	1173	110	1199	36	1173	110	-0.1

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-32	119	7976	0.0789	3.8	2.1330	8.0	0.1971	2.3	1173	81	1160.2	24	1173	81	1.2
TS-32	58	2735	0.0813	3.3	2.5340	9.5	0.2229	2.3	1230	67	1298	27	1230	67	-5.5
TS-32	50	3085	0.0860	25.6	2.6100	21.1	0.2080	7.7	1310	470	1240	79	1310	470	7.4
TS-32	26	4029	0.0860	3.8	2.6480	9.4	0.2233	3.0	1335	73	1300	34	1335	73	2.7
TS-32	1	1546	0.0892	19.1	2.8000	16.4	0.2285	4.8	1387	360	1337	52	1387	360	4.6
TS-32	37	8963	0.0886	2.3	3.0760	8.8	0.2479	2.4	1394.3	44	1428	30	1394.3	44	-2.5
TS-32	12	2676	0.0893	3.7	2.8630	9.1	0.2320	2.6	1415	71	1349	30	1415	71	4.9
TS-32	56	21790	0.0901	3.3	3.0620	9.5	0.2429	2.3	1425	62	1400.2	29	1425	62	1.6
TS-32	25	1434	0.0906	4.1	3.1860	8.8	0.2533	2.7	1443	86	1457	34	1443	86	-0.8
TS-32	45	5577	0.0920	4.1	3.0140	9.6	0.2366	2.3	1468	81	1368	29	1468	81	6.7
TS-32	98	1209	0.0948	15.8	3.1200	17.6	0.2380	5.5	1498	330	1385	67	1498	330	8.5
TS-32	59	1612	0.0955	11.5	3.1800	16.7	0.2399	3.9	1532	220	1402	45	1532	220	9.7
TS-32	90	5107	0.0986	3.4	3.3680	8.6	0.2528	2.3	1597.2	65	1452.7	30	1597.2	65	9.1
TS-32	63	3776	0.1003	4.5	3.6290	9.9	0.2639	2.8	1628	83	1518	32	1628	83	7.1
TS-32	112	2237	0.1012	13.8	3.7300	15.0	0.2672	3.7	1634	270	1529	50	1634	270	6.7
TS-32	110	2063	0.1012	3.0	4.2300	10.6	0.3030	2.6	1648	60	1709	39	1648	60	-3.5
TS-32	22	1220	0.1013	4.2	4.2160	10.7	0.2955	2.5	1657	91	1672	35	1657	91	-0.7
TS-32	68	9823	0.1011	4.0	4.4200	9.3	0.3071	2.4	1661	88	1727	36	1661	88	-3.9
TS-32	70	5727	0.1022	3.1	4.2690	9.4	0.2991	2.2	1664	59	1686.9	34	1664	59	-1.4
TS-32	108	7445	0.1022	2.5	4.1460	9.2	0.2951	2.4	1665.1	45	1668	34	1665.1	45	-0.1
TS-32	95	45933	0.1023	2.5	4.1910	9.5	0.3006	2.5	1666	48	1693	36	1666	48	-1.7
TS-32	92	4412	0.1026	2.7	4.0830	9.3	0.2925	2.3	1670.8	50	1654	34	1670.8	50	1.0
TS-32	114	6718	0.1029	2.8	4.4130	8.6	0.3093	2.6	1679	54	1737	36	1679	54	-3.5
TS-32	17	19590	0.1031	1.1	4.4480	8.8	0.3102	2.3	1680	53	1742	35	1680	53	-3.7
TS-32	104	2214	0.1034	3.0	4.3260	8.6	0.3026	2.3	1685	56	1704	34	1685	56	-1.1
TS-32	103	12524	0.1035	3.4	3.8710	10.1	0.2701	3.0	1687	64	1547	39	1687	64	8.4
TS-32	85	7813	0.1035	2.6	4.2720	8.7	0.3047	2.3	1688	49	1713.9	34	1688	49	-1.6
TS-32	4	2518	0.1038	3.2	3.9920	11.0	0.2840	2.5	1691	58	1612	34	1691	58	4.7
TS-32	67	1444	0.1041	4.0	3.8340	11.5	0.2704	2.9	1696	73	1546	38	1696	73	9.1
TS-32	53	4707	0.1039	3.6	4.1490	9.2	0.2850	2.4	1696.1	67	1618	34	1696.1	67	4.7
TS-32	86	3545	0.1041	3.5	4.2560	12.0	0.2988	2.7	1697	64	1685	42	1697	64	0.7
TS-32	55	6711	0.1040	5.5	3.9320	9.2	0.2723	3.1	1701	110	1546	44	1701	110	8.8
TS-32	28	9059	0.1045	2.2	4.4930	9.3	0.3096	2.6	1705.7	41	1738	40	1705.7	41	-1.9

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-32	80	2837	0.1046	6.4	3.8790	12.4	0.2726	2.4	1706	120	1558	32	1706	120	8.9
TS-32	93	13538	0.1046	2.6	4.1190	8.7	0.2901	2.4	1706.5	48	1643.9	33	1706.5	48	3.7
TS-32	77	17118	0.1046	2.6	4.3300	8.8	0.3009	2.5	1707.6	48	1695	37	1707.6	48	0.7
TS-32	33	9271	0.1049	3.4	4.7230	8.7	0.3211	2.5	1714	66	1795	38	1714	66	-4.7
TS-32	65	5628	0.1051	2.9	4.5790	9.0	0.3113	2.5	1715.5	52	1747	37	1715.5	52	-1.8
TS-32	16	16924	0.1054	3.2	4.2230	10.4	0.2883	2.6	1721.1	58	1634	36	1721.1	58	5.1
TS-32	5	1228	0.1056	4.0	4.0800	10.0	0.2832	3.4	1723	72	1605	48	1723	72	6.8
TS-32	29	8870	0.1056	3.9	4.0750	8.8	0.2782	2.3	1723.4	70	1582.9	32	1723.4	70	8.2
TS-32	15	7668	0.1056	2.5	4.7500	9.7	0.3205	2.4	1724.6	45	1788	38	1724.6	45	-3.9
TS-32	84	5157	0.1062	3.3	4.4160	9.7	0.3040	2.6	1733	59	1711	38	1733	59	1.3
TS-32	89	2997	0.1063	3.2	4.0480	10.1	0.2805	2.5	1736	58	1596	34	1736	58	8.2
TS-32	102	8822	0.1067	2.5	4.5130	8.9	0.3087	2.3	1742.8	46	1733	35	1742.8	46	0.5
TS-32	78	2536	0.1086	3.2	4.4350	8.6	0.2978	2.5	1778	61	1686	36	1778	61	5.5
TS-32	100	12467	0.1096	1.1	5.2480	8.8	0.3478	2.4	1810	43	1924	40	1810	43	-6.3
TS-32	106	2940	0.1220	2.7	6.0080	8.8	0.3581	2.4	1984	48	1972	41	1984	48	0.6
TS-33	32	134	0.0500	2.8	0.1354	3.8	0.0204	4.3	182	62	131.2	5.2	131.2	5.2	28.4
TS-33	4	666	0.0489	2.2	0.1463	3.4	0.0223	4.0	139	51	142.6	5.6	142.6	5.6	-2.3
TS-33	67	1471	0.0481	1.8	0.1484	3.1	0.0227	4.2	98	40	145.1	5.6	145.1	5.6	-47.3
TS-33	117	368	0.0472	1.3	0.1473	3.3	0.0228	4.8	55	30	146.1	6.1	146.1	6.1	-164.2
TS-33	41	1914	0.0555	2.3	0.4040	4.5	0.0553	4.3	428	53	348.1	14	348.1	14	18.9
TS-33	27	2787	0.0550	0.7	0.4840	3.3	0.0638	3.6	413	15	414	15	414	15	3.5
TS-33	108	316	0.0556	1.6	0.5000	8.0	0.0655	4.9	434	36	446	19	446	19	5.8
TS-33	43	1371	0.0619	0.8	0.8969	4.3	0.1048	3.8	668.8	17	672.3	24	668.8	17	4.0
TS-33	68	1040	0.0655	4.7	1.1180	7.5	0.1231	5.3	787	96	788	38	787	96	5.1
TS-33	89	1896	0.0665	12.2	1.3080	6.3	0.1422	4.6	816	250	879	39	816	250	-5.0
TS-33	66	1744	0.0672	3.3	1.2500	6.3	0.1343	4.2	843	67	844	32	843	67	3.4
TS-33	24	3556	0.0681	2.2	1.2970	6.5	0.1379	4.3	870	44	870	33	870	44	4.4
TS-33	13	1124	0.0684	4.8	1.3010	5.3	0.1365	4.2	881	100	848	33	881	100	6.4
TS-33	118	503	0.0685	2.6	1.3270	7.5	0.1408	5.0	885	56	868	37	885	56	4.2
TS-33	48	2463	0.0702	4.4	1.5340	7.2	0.1579	4.4	934	99	984	39	934	99	-1.2
TS-33	70	2132	0.0702	1.2	1.4350	4.5	0.1480	4.1	934.1	25	929	33	934.1	25	4.8
TS-33	56	836	0.0707	3.7	1.4730	7.5	0.1508	4.3	948	75	948	36	948	75	4.5
TS-33	42	4061	0.0704	4.7	1.4930	8.7	0.1540	4.5	955	120	958	38	955	120	3.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-33	60	466	0.0716	7.8	1.4700	8.8	0.1498	5.9	986	150	940	51	986	150	8.9
TS-33	11	1628	0.0733	4.1	1.6570	6.0	0.1622	3.9	1020	81	1004.2	36	1020	81	5.0
TS-33	96	923	0.0750	4.4	1.7580	8.5	0.1693	4.5	1063	90	1052	40	1063	90	5.2
TS-33	57	426	0.0750	4.4	1.6820	9.5	0.1649	5.3	1071	91	1054	52	1071	91	8.2
TS-33	63	665	0.0798	3.0	2.0280	6.4	0.1867	4.4	1191	61	1121	40	1191	61	7.4
TS-33	50	658	0.0806	5.5	2.2440	8.5	0.2028	4.1	1215	110	1232	45	1215	110	2.1
TS-33	5	1092	0.0864	7.9	2.5900	10.4	0.2166	5.1	1337	150	1287	48	1337	150	5.5
TS-33	15	8227	0.0886	7.2	2.7080	11.1	0.2194	5.0	1390	140	1288.5	45	1390	140	8.0
TS-33	65	5247	0.0891	1.7	3.0110	5.6	0.2414	4.1	1404	31	1395	49	1404	31	0.7
TS-33	75	16263	0.0897	2.1	3.0240	5.0	0.2452	4.1	1412	39	1411	49	1412	39	-0.1
TS-33	7	18018	0.0899	1.3	3.1020	4.5	0.2496	3.7	1423	25	1437.2	49	1423	25	-0.9
TS-33	51	3186	0.0911	8.8	2.9200	15.1	0.2308	4.8	1425	170	1366.1	47	1425	170	6.0
TS-33	26	360	0.0916	6.4	3.0500	9.5	0.2463	4.9	1440	130	1455	52	1440	130	1.5
TS-33	8	350000	0.0939	8.0	3.0600	10.1	0.2430	4.9	1481	160	1418	59	1481	160	5.5
TS-33	40	1952	0.0929	3.6	3.2700	7.6	0.2626	5.0	1499	61	1492	51	1499	61	-0.3
TS-33	109	1658	0.0960	12.5	3.1700	19.6	0.2428	4.9	1529	250	1414.9	49	1529	250	8.4
TS-33	37	1358	0.0955	2.7	3.2260	5.6	0.2511	3.9	1536	52	1442	51	1536	52	6.0
TS-33	25	3029	0.0945	7.9	3.3000	16.1	0.2503	4.8	1536	160	1475	51	1536	160	6.3
TS-33	85	6228	0.0981	11.2	3.5400	10.7	0.2590	6.9	1576	220	1489	90	1576	220	6.2
TS-33	31	2776	0.0992	8.6	3.4380	13.7	0.2526	4.4	1605	170	1458.9	50	1605	170	9.5
TS-33	120	1607	0.1012	4.2	3.8500	7.3	0.2742	4.0	1617	100	1574	54	1617	100	3.3
TS-33	115	10941	0.1004	9.3	3.9100	8.7	0.2758	4.7	1622	190	1580	56	1622	190	3.0
TS-33	33	8889	0.1002	4.5	3.5810	7.5	0.2648	4.5	1630	80	1518	54	1630	80	7.1
TS-33	53	898	0.1014	4.6	3.7300	10.2	0.2673	5.2	1633	86	1546	57	1633	86	6.6
TS-33	97	5458	0.1010	9.3	3.6300	9.1	0.2598	4.6	1633	180	1490	55	1633	180	8.9
TS-33	92	1766	0.1012	5.5	3.7900	9.5	0.2772	4.3	1642	110	1583	56	1642	110	4.0
TS-33	58	1629	0.1009	2.5	4.0600	7.4	0.2856	4.9	1643	44	1625	56	1643	44	1.5
TS-33	113	1111	0.1006	2.8	3.8700	8.3	0.2858	4.5	1645	52	1625	57	1645	52	1.5
TS-33	55	870	0.1012	4.7	3.8800	9.5	0.2826	4.6	1656	93	1625	56	1656	93	3.1
TS-33	102	5045	0.1017	1.2	4.3760	4.3	0.3067	3.9	1661	31	1724	58	1661	31	-3.8
TS-33	119	641	0.1017	5.1	3.8300	11.0	0.2712	4.8	1663	110	1563	54	1663	110	7.0
TS-33	6	1354	0.1022	3.0	3.7600	6.4	0.2713	4.4	1666	61	1560	57	1666	61	7.1
TS-33	46	13980	0.1026	2.4	3.9940	7.0	0.2832	3.9	1670	45	1610	54	1670	45	3.8

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-33	64	3158	0.1028	2.4	4.2960	5.1	0.2993	3.7	1673	46	1692	58	1673	46	-0.9
TS-33	17	4359	0.1020	4.0	4.0100	6.5	0.2783	4.3	1673	79	1582	57	1673	79	5.4
TS-33	107	5133	0.1026	1.8	4.2830	5.8	0.2978	3.7	1676	38	1682	57	1676	38	-0.2
TS-33	16	2396	0.1032	4.7	4.0900	8.6	0.2843	4.2	1678	91	1615	60	1678	91	3.9
TS-33	19	1614	0.1028	3.2	4.0750	6.4	0.2872	4.2	1679	64	1628	56	1679	64	3.1
TS-33	112	2094	0.1034	2.3	4.2950	6.8	0.3003	4.3	1684	43	1692	59	1684	43	-0.5
TS-33	28	3731	0.1033	1.8	4.1500	4.8	0.2939	3.7	1684.2	34	1662.8	56	1684.2	34	1.4
TS-33	98	5677	0.1034	1.4	4.1120	4.6	0.2899	3.8	1686	25	1642.1	55	1686	25	2.6
TS-33	90	625	0.1036	2.7	4.2400	7.5	0.3029	4.6	1690	55	1703	59	1690	55	-0.9
TS-33	35	2274	0.1039	2.6	4.3080	6.7	0.3039	4.3	1691	47	1709	58	1691	47	-1.1
TS-33	103	5326	0.1035	2.4	4.3580	6.7	0.3026	3.6	1691	50	1703	57	1691	50	-0.8
TS-33	61	3304	0.1039	2.3	4.3650	6.2	0.3023	3.6	1692	55	1706	58	1692	55	-0.7
TS-33	84	16313	0.1039	1.9	4.2620	5.2	0.2999	3.7	1694	37	1691	57	1694	37	0.2
TS-33	91	2174	0.1040	2.5	3.9150	5.6	0.2755	4.0	1696	46	1571.2	53	1696	46	7.5
TS-33	3	4968	0.1042	1.8	4.1720	4.8	0.2952	4.1	1696	39	1667.8	56	1696	39	1.7
TS-33	29	6486	0.1049	5.7	4.5810	5.2	0.3227	4.0	1699	120	1809	66	1699	120	-6.1
TS-33	59	11660	0.1038	1.8	4.2420	4.5	0.2901	3.8	1699	33	1642	56	1699	33	3.4
TS-33	76	12178	0.1037	2.2	4.3650	6.2	0.3078	3.9	1699	42	1725	59	1699	42	-1.8
TS-33	20	10143	0.1043	4.0	4.1330	4.8	0.2807	3.9	1700	72	1594	56	1700	72	6.2
TS-33	86	3415	0.1040	3.4	4.5280	6.6	0.3181	4.1	1701	70	1780	60	1701	70	-4.6
TS-33	36	2060	0.1053	3.4	4.5500	7.9	0.3157	4.1	1703	74	1773	60	1703	74	-3.8
TS-33	21	2273	0.1037	3.0	4.3000	6.0	0.2978	4.7	1705	64	1680	58	1705	64	1.2
TS-33	39	3214	0.1047	1.6	4.1930	5.7	0.2956	3.7	1709	29	1668	56	1709	29	2.3
TS-33	71	5707	0.1048	1.6	4.4670	5.4	0.3111	3.9	1709	30	1743	59	1709	30	-2.2
TS-33	111	18200	0.1047	1.3	4.4580	5.2	0.3071	3.9	1709	25	1726	59	1709	25	-1.0
TS-33	87	7900	0.1049	2.1	4.4930	5.1	0.3112	4.5	1711	40	1746	59	1711	40	-2.2
TS-33	101	627	0.1052	2.9	4.3600	6.2	0.3032	4.9	1714	55	1710	61	1714	55	0.3
TS-33	18	5838	0.1047	5.3	4.0860	9.1	0.2800	4.6	1714	110	1592.7	54	1714	110	7.2
TS-33	72	3467	0.1050	3.7	3.9690	6.3	0.2775	4.0	1715	72	1580	54	1715	72	7.9
TS-33	73	5328	0.1053	2.7	4.2350	5.4	0.2919	3.8	1721	47	1646	57	1721	47	4.1
TS-33	22	2992	0.1054	3.7	4.2060	5.7	0.2847	4.2	1722	65	1620	57	1722	65	6.3
TS-33	106	11138	0.1056	2.0	4.6530	5.6	0.3141	3.8	1724	36	1760	62	1724	36	-2.1
TS-33	82	1702	0.1058	2.5	4.4500	7.0	0.3084	4.5	1727	43	1729	59	1727	43	-0.3

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-33	69	1785	0.1055	2.7	4.1630	6.0	0.2886	4.2	1730	56	1635	55	1730	56	5.4
TS-33	12	441	0.1074	3.7	4.2800	7.2	0.2889	4.8	1731	92	1657	56	1731	92	5.5
TS-33	88	1414	0.1061	2.7	4.3080	6.3	0.2973	4.0	1731	48	1677	57	1731	48	3.1
TS-33	77	8803	0.1064	6.9	3.9720	12.3	0.2749	4.7	1731	140	1571	53	1731	140	9.5
TS-33	2	892	0.1055	3.0	4.3900	5.2	0.3036	4.3	1732	51	1708	62	1732	51	1.4
TS-33	47	3981	0.1063	3.1	4.3750	4.8	0.3009	3.7	1734	56	1696	59	1734	56	2.2
TS-33	38	3512	0.1063	1.5	4.3070	4.9	0.2997	4.0	1737	28	1689	60	1737	28	2.8
TS-33	45	1395	0.1055	3.4	4.5200	6.9	0.3106	4.2	1739	77	1746	62	1739	77	-0.2
TS-33	44	5870	0.1066	1.9	4.5010	4.9	0.3099	3.5	1741	34	1744	58	1741	34	0.1
TS-33	23	5250	0.1059	3.3	4.1800	6.0	0.2864	3.8	1742	80	1623	55	1742	80	6.8
TS-33	104	10710	0.1065	6.4	4.2500	8.2	0.2842	4.6	1742	120	1611	61	1742	120	7.5
TS-33	100	69300	0.1060	1.4	4.8100	4.8	0.3268	4.3	1743	25	1822	68	1743	25	-4.5
TS-33	1	1563	0.1070	4.7	4.6500	10.3	0.3209	4.4	1768	100	1798	62	1768	100	-1.6
TS-33	116	4606	0.1083	2.9	4.4560	5.4	0.2967	4.0	1772	49	1675	57	1772	49	5.5
TS-33	78	5093	0.1189	1.9	5.5580	4.7	0.3394	3.8	1941	32	1883	63	1941	32	3.0
TS-34	12	266	0.0465	0.6	0.0836	2.0	0.0132	3.8	20	12	84.1	3.1	84.1	3.1	-321.0
TS-34	111	69	0.0463	0.6	0.0874	3.8	0.0136	5.1	8.4	8.5	87.5	4.1	87.5	4.1	-938.1
TS-34	18	777	0.0470	0.9	0.0897	2.1	0.0137	3.7	47	20	87.5	3.2	87.5	3.2	-86.8
TS-34	40	1222	0.0474	1.1	0.0922	2.3	0.0141	3.8	63	24	90.6	3.3	90.6	3.3	-43.5
TS-34	41	350000	0.0463	0.7	0.0947	3.5	0.0148	5.1	14	15	94.8	4.2	94.8	4.2	-577.1
TS-34	90	1932	0.0481	1.1	0.0976	2.5	0.0150	3.9	100	25	95.9	3.4	95.9	3.4	4.1
TS-34	65	483	0.0472	1.3	0.1037	2.1	0.0161	3.8	57	29	102.6	3.8	102.6	3.8	-80.4
TS-34	43	1358	0.0477	1.0	0.1105	2.5	0.0168	3.8	79	23	107.7	3.9	107.7	3.9	-36.1
TS-34	117	312	0.0495	5.5	0.1192	5.5	0.0173	3.9	335	57	110.8	4.3	110.8	4.3	66.9
TS-34	92	9865	0.0485	1.1	0.1486	1.8	0.0224	3.6	123	27	143.4	4.9	143.4	4.9	-16.3
TS-34	78	2614	0.0485	1.2	0.1536	2.9	0.0228	3.7	118	27	145.8	5.1	145.8	5.1	-23.3
TS-34	31	1514	0.0473	1.0	0.1594	2.4	0.0243	4.0	63	23	154.9	5.6	154.9	5.6	-145.2
TS-34	6	488	0.0479	1.3	0.2261	2.6	0.0339	4.1	89	30	216.7	7.9	216.7	7.9	-141.5
TS-34	84	634	0.0488	1.8	0.3190	9.1	0.0467	6.6	129	40	307	19	307	19	-127.9
TS-34	119	860	0.0552	0.3	0.4812	3.5	0.0631	3.8	419.2	6.7	418.6	15	418.6	15	5.9
TS-34	75	756	0.0570	0.4	0.5810	3.3	0.0739	4.1	490.1	8.6	490.1	18	490.1	18	6.3
TS-34	91	2564	0.0579	0.3	0.6480	3.4	0.0812	3.7	525.4	6.4	525.4	18	525.4	18	4.2
TS-34	81	1231	0.0616	0.7	0.8660	4.8	0.1017	4.2	661	14	661	26	661	14	5.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-34	62	2161	0.0648	2.0	1.1120	8.8	0.1234	6.8	769	46	787	48	769	46	2.0
TS-34	53	1185	0.0650	0.8	1.0910	4.9	0.1215	4.3	773	17	777	28	773	17	4.4
TS-34	44	674	0.0651	0.8	1.0890	4.7	0.1210	4.2	776	16	776	30	776	16	5.2
TS-34	79	2503	0.0664	0.7	1.1840	4.4	0.1291	4.0	816	15	816	30	816	15	4.0
TS-34	3	1941	0.0669	0.6	1.2240	4.7	0.1327	3.8	835	12	835	28	835	12	3.8
TS-34	19	821	0.0673	0.4	1.2290	3.5	0.1326	3.7	845.6	8.7	846.2	28	845.6	8.7	5.1
TS-34	23	1571	0.0675	1.3	1.2780	6.1	0.1365	4.9	858	25	863	36	858	25	4.0
TS-34	36	2197	0.0750	1.5	1.7320	3.3	0.1673	3.3	1070	30	1032	34	1070	30	6.8
TS-34	2	2372	0.0757	1.3	1.8750	5.9	0.1797	4.6	1084	28	1095	44	1084	28	1.8
TS-34	109	70000	0.0791	1.3	2.0500	3.2	0.1918	3.5	1173	16	1131	36	1173	16	3.6
TS-34	5	121750	0.0799	3.4	1.9600	8.2	0.1780	4.6	1175	61	1085	42	1175	61	10.0
TS-34	120	3729	0.0801	1.9	2.0150	4.5	0.1852	4.0	1209	37	1099	39	1209	37	9.4
TS-34	47	2394	0.0818	1.2	2.4800	3.3	0.2170	3.6	1239	23	1265	42	1239	23	-2.2
TS-34	61	4333	0.0848	3.5	2.3300	8.6	0.1978	5.1	1290	68	1185	53	1290	68	9.9
TS-34	85	22733	0.0845	0.8	2.7160	3.6	0.2342	3.7	1302	16	1352	42	1302	16	-4.1
TS-34	87	1664	0.0858	1.0	2.6610	3.5	0.2247	3.9	1331	19	1330	42	1331	19	1.9
TS-34	30	16000	0.0880	0.4	2.9080	3.0	0.2371	3.5	1382.5	8.3	1372.7	43	1382.5	8.3	0.7
TS-34	64	2645	0.0881	0.9	3.0230	3.2	0.2464	3.5	1383	17	1416	45	1383	17	-2.6
TS-34	10	1531	0.0882	1.1	2.9260	3.8	0.2383	3.7	1388	22	1378	44	1388	22	0.7
TS-34	76	6982	0.0898	1.0	3.1160	3.0	0.2500	3.6	1422	19	1439	45	1422	19	-1.1
TS-34	24	11920	0.0897	0.8	2.8620	2.9	0.2335	3.5	1425.2	7.2	1352.7	42	1425.2	7.2	5.1
TS-34	14	4150	0.0904	1.1	3.0150	3.6	0.2432	3.6	1436	23	1404	45	1436	23	2.3
TS-34	94	853	0.0905	1.9	3.0610	3.9	0.2453	3.8	1439	36	1412	45	1439	36	1.7
TS-34	29	4708	0.0910	1.1	3.0830	3.6	0.2440	3.4	1450	18	1406	44	1450	18	3.0
TS-34	57	7057	0.0987	3.0	3.6300	8.0	0.2670	5.6	1598	61	1538	71	1598	61	4.6
TS-34	115	12040	0.1006	1.2	3.9400	3.0	0.2917	3.4	1633	15	1650	51	1633	15	-1.0
TS-34	34	1865	0.1014	2.4	4.1500	5.5	0.2948	3.7	1638	44	1657	56	1638	44	-1.6
TS-34	98	2438	0.1016	1.3	4.0070	4.5	0.2846	3.9	1657	22	1618	50	1657	22	2.6
TS-34	39	9568	0.1021	1.1	4.3030	3.3	0.3022	4.0	1663	19	1699	53	1663	19	-2.5
TS-34	112	7648	0.1023	1.4	4.0240	3.7	0.2867	3.8	1666	27	1626	52	1666	27	2.2
TS-34	52	2260	0.1021	1.2	4.3210	3.0	0.3028	3.3	1667	24	1704	52	1667	24	-2.3
TS-34	97	18250	0.1025	0.6	3.9530	3.0	0.2800	3.6	1669	11	1591	50	1669	11	4.7
TS-34	17	6469	0.1026	1.2	4.2500	3.3	0.3012	3.7	1673	21	1697	54	1673	21	-1.4

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-34	70	26510	0.1027	1.8	4.2070	3.3	0.2954	3.4	1674	17	1670	53	1674	17	0.2
TS-34	25	2339	0.1026	1.2	3.8970	3.8	0.2797	3.6	1675	23	1587	51	1675	23	5.1
TS-34	59	4819	0.1030	0.6	4.2280	3.1	0.2949	3.4	1678	11	1666	53	1678	11	0.8
TS-34	80	6123	0.1030	0.3	4.0010	3.0	0.2838	3.5	1678.3	6.4	1610.7	49	1678.3	6.4	4.0
TS-34	55	11765	0.1030	0.5	4.4150	3.6	0.3051	3.9	1678.5	8.9	1716	59	1678.5	8.9	-2.5
TS-34	67	12313	0.1030	0.5	4.4140	2.7	0.3055	3.6	1678.8	9.2	1717.9	52	1678.8	9.2	-2.3
TS-34	69	3862	0.1031	0.5	4.2940	3.0	0.2969	3.4	1679.4	9.6	1676	51	1679.4	9.6	0.2
TS-34	95	4035	0.1031	0.7	4.1040	3.4	0.2886	3.8	1681	12	1634	52	1681	12	2.8
TS-34	9	6552	0.1032	0.5	4.5170	3.1	0.3157	3.5	1681	10	1768	55	1681	10	-5.2
TS-34	20	3552	0.1032	0.6	4.1860	3.1	0.2974	3.7	1682	11	1677	51	1682	11	0.2
TS-34	32	9603	0.1032	1.5	4.3010	3.3	0.2976	3.7	1682	14	1679	52	1682	14	0.2
TS-34	49	16558	0.1032	0.3	4.3990	3.0	0.3054	3.6	1682.8	6.5	1718	54	1682.8	6.5	-2.1
TS-34	99	3109	0.1033	0.6	4.4200	3.2	0.3071	3.6	1684	12	1725	53	1684	12	-2.5
TS-34	7	10909	0.1034	0.5	4.0100	3.7	0.2789	4.3	1685	10	1597	55	1685	10	5.8
TS-34	102	6219	0.1034	0.4	4.3210	3.0	0.3014	3.3	1685.9	7.7	1698	52	1685.9	7.7	-0.7
TS-34	15	10957	0.1033	0.5	4.1920	3.3	0.2962	3.7	1686.2	9.9	1674	55	1686.2	9.9	0.8
TS-34	83	4055	0.1037	1.4	4.0700	4.9	0.2890	3.8	1687	27	1640	53	1687	27	2.8
TS-34	106	738	0.1041	3.0	4.0600	5.4	0.2841	4.2	1688	57	1612	51	1688	57	4.6
TS-34	74	2460	0.1035	0.9	4.3200	3.0	0.3011	3.7	1689	16	1697	52	1689	16	-0.5
TS-34	100	4928	0.1036	0.9	4.1750	3.8	0.2892	3.8	1689	16	1637	57	1689	16	3.1
TS-34	42	26715	0.1037	1.4	4.4560	3.1	0.3047	3.6	1689	17	1714	53	1689	17	-1.5
TS-34	108	10387	0.1033	0.8	4.1820	2.9	0.2963	3.4	1690.3	6.6	1673	51	1690.3	6.6	1.0
TS-34	71	5885	0.1037	0.7	4.3630	3.0	0.3020	3.3	1691	12	1701.2	51	1691	12	-0.6
TS-34	113	7048	0.1039	0.5	3.7820	3.4	0.2703	3.7	1693.7	9.1	1545.2	47	1693.7	9.1	8.9
TS-34	21	3200	0.1041	1.2	3.7380	3.5	0.2697	3.6	1696	22	1540	49	1696	22	9.3
TS-34	110	4313	0.1042	1.0	3.9250	3.3	0.2766	3.6	1698	19	1574	49	1698	19	7.2
TS-34	46	2160	0.1040	0.8	4.0200	5.0	0.2791	4.3	1699	16	1594	57	1699	16	6.7
TS-34	16	5777	0.1042	0.5	4.1820	3.1	0.2951	3.4	1700	10	1667	51	1700	10	1.9
TS-34	35	28985	0.1042	0.3	4.0740	2.9	0.2807	3.5	1700.7	6.2	1594	49	1700.7	6.2	6.3
TS-34	50	4764	0.1043	0.8	4.4630	2.9	0.3065	3.6	1703	14	1723	52	1703	14	-1.2
TS-34	58	8618	0.1044	1.0	4.3780	3.2	0.3037	3.6	1703	18	1710	54	1703	18	-0.4
TS-34	60	1446	0.1049	2.1	4.6800	5.1	0.3197	4.1	1705	40	1794	58	1705	40	-5.0
TS-34	105	3104	0.1045	0.6	4.0250	3.5	0.2789	3.6	1705	11	1587	50	1705	11	7.0

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-34	1	5028	0.1043	1.6	4.2100	4.3	0.2926	3.8	1707	33	1657	53	1707	33	3.1
TS-34	33	2727	0.1050	1.3	4.4460	3.6	0.3047	3.9	1712	25	1711	53	1712	25	-0.1
TS-34	8	3249	0.1046	0.7	4.1350	2.9	0.2841	3.4	1712	14	1611	50	1712	14	5.8
TS-34	77	4485	0.1050	0.8	4.3640	3.2	0.3022	3.6	1713	14	1703	54	1713	14	0.6
TS-34	88	3331	0.1050	0.5	4.1130	3.2	0.2899	3.4	1714.2	9.6	1641	50	1714.2	9.6	4.3
TS-34	93	3413	0.1050	0.9	4.2530	3.1	0.2973	3.4	1716	17	1679	51	1716	17	2.2
TS-34	4	5000	0.1052	0.5	4.0050	3.0	0.2773	3.6	1716.4	8.7	1578	50	1716.4	8.7	8.1
TS-34	51	38150	0.1051	1.1	4.1100	4.9	0.2840	4.9	1718	22	1609	68	1718	22	6.4
TS-34	27	43500	0.1054	0.9	4.1020	3.2	0.2832	3.4	1721	16	1607	49	1721	16	6.6
TS-34	22	5892	0.1055	0.6	4.3490	3.4	0.3024	4.0	1723	10	1702	57	1723	10	1.2
TS-34	96	1504	0.1056	1.3	4.1880	3.6	0.2897	3.8	1729	24	1640	53	1729	24	5.1
TS-34	73	11800	0.1061	0.8	4.3070	3.3	0.2920	3.8	1732	15	1650	54	1732	15	4.7
TS-34	54	14837	0.1061	1.6	4.6250	3.0	0.3116	3.5	1738	15	1751	53	1738	15	-0.7
TS-34	26	5196	0.1062	0.9	4.0490	3.5	0.2793	3.4	1740	18	1587	49	1740	18	8.7
TS-34	13	8871	0.1068	1.1	4.2310	3.5	0.2887	3.8	1745	20	1641	56	1745	20	6.1
TS-34	114	14833	0.1074	1.7	4.2750	3.3	0.2968	3.4	1745	16	1675	52	1745	16	4.0
TS-34	66	1906	0.1082	0.8	4.7520	2.9	0.3159	3.5	1767	14	1769	53	1767	14	-0.2
TS-34	116	6544	0.1085	0.8	4.6460	3.0	0.3160	3.5	1768.3	8.4	1770	55	1768.3	8.4	-0.1
TS-34	28	350000	0.1094	0.7	4.7210	3.4	0.3151	3.5	1790	13	1767	55	1790	13	1.4
TS-34	107	4027	0.1877	0.4	13.0100	3.2	0.5055	3.4	2722.8	5.6	2634	74	2722.8	5.6	3.2
TS-34	56	10956	0.2053	0.8	16.6900	3.5	0.5866	3.6	2868	13	2977	87	2868	13	-3.7
TS-35	45	279	0.0465	0.5	0.0838	2.5	0.0130	3.1	22	12	83.8	2.3	83.8	2.3	-279.1
TS-35	31	93	0.0516	7.2	0.1028	7.9	0.0145	3.3	458	76	92.5	3	92.5	3	79.8
TS-35	55	164	0.0467	1.0	0.0938	3.5	0.0146	3.6	21	16	93.6	3.1	93.6	3.1	-345.7
TS-35	115	103	0.0462	0.2	0.0939	2.9	0.0147	3.6	7.6	5.6	93.7	3.1	93.7	3.1	-1140.8
TS-35	20	79	0.0467	0.9	0.0956	2.9	0.0149	3.6	29	21	95	3.3	95	3.3	-228.6
TS-35	71	56	0.0468	1.0	0.0953	2.7	0.0149	3.5	34	22	95.2	3	95.2	3	-179.7
TS-35	106	288	0.0467	1.0	0.0962	3.4	0.0149	3.7	34	22	96	3.2	96	3.2	-180.6
TS-35	56	233	0.0468	1.3	0.0967	3.0	0.0151	3.8	22	18	97.3	3.2	97.3	3.2	-340.5
TS-35	35	1465	0.0462	0.3	0.0993	3.6	0.0155	3.9	8.8	6.6	98.9	3.7	98.9	3.7	-1022.7
TS-35	79	174	0.0470	1.3	0.1000	3.1	0.0157	3.5	47	28	100.4	3.3	100.4	3.3	-113.0
TS-35	83	199	0.0470	1.1	0.1008	2.9	0.0157	3.2	41	23	100.7	3.2	100.7	3.2	-145.1
TS-35	84	135	0.0467	1.3	0.1012	3.7	0.0157	4.2	21	19	101	3.7	101	3.7	-377.6

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-35	50	138	0.0461	0.0	0.1031	3.3	0.0162	3.8	2.02	0.38	103.6	3.6	103.6	3.6	-5018.8
TS-35	89	737	0.0470	8.5	0.1069	9.4	0.0167	3.8	354	70	106.7	4	106.7	4	69.9
TS-35	82	271	0.0474	1.8	0.1073	3.4	0.0168	3.6	42	27	107.6	3.6	107.6	3.6	-155.5
TS-35	60	295	0.0463	0.4	0.1487	3.1	0.0230	3.4	11.4	8.8	146.9	4.5	146.9	4.5	-1186.0
TS-35	113	982	0.0478	1.2	0.2290	2.8	0.0346	3.2	84	27	218.5	5.9	218.5	5.9	-161.0
TS-35	21	742	0.0480	1.4	0.2355	3.1	0.0357	3.1	92	31	227	6.4	227	6.4	-145.5
TS-35	14	213	0.0476	1.2	0.2344	2.9	0.0356	3.4	73	27	227.2	6	227.2	6	-209.0
TS-35	25	1014	0.0486	1.5	0.2397	3.3	0.0357	2.8	129	35	228	6.3	228	6.3	-75.5
TS-35	105	492	0.0483	1.7	0.2378	3.6	0.0358	3.1	107	37	228.1	6.5	228.1	6.5	-111.7
TS-35	40	325	0.0476	1.3	0.2488	3.2	0.0374	3.2	74	29	237.5	7	237.5	7	-219.6
TS-35	42	1113	0.0468	1.0	0.2461	3.2	0.0377	4.0	35	22	239.2	7.7	239.2	7.7	-581.7
TS-35	95	1672	0.0518	3.5	0.2786	5.7	0.0389	2.6	301	40	245.7	6.5	245.7	6.5	18.4
TS-35	87	3440	0.0486	1.6	0.2611	3.5	0.0391	3.1	120	36	247.9	6.9	247.9	6.9	-105.9
TS-35	101	1371	0.0490	1.3	0.2655	3.3	0.0395	2.8	142	30	250.5	6.3	250.5	6.3	-76.0
TS-35	48	382	0.0488	2.0	0.3072	3.9	0.0451	3.1	129	46	285	7.7	285	7.7	-120.5
TS-35	104	783	0.0462	0.4	0.2885	3.2	0.0452	2.9	9.2	8.6	300.7	8.6	300.7	8.6	-2995.7
TS-35	8	1271	0.0526	1.7	0.5033	5.0	0.0678	2.7	305	39	422.2	10	422.2	10	-38.7
TS-35	51	463	0.0566	0.2	0.5555	3.4	0.0712	2.9	475.1	3.8	475.1	12	475.1	12	6.7
TS-35	16	809	0.0571	0.6	0.5920	6.3	0.0750	3.7	496	14	496	18	496	18	6.0
TS-35	7	1414	0.0559	2.3	0.6620	3.9	0.0852	2.7	444	57	529.6	13	529.6	13	-18.7
TS-35	10	801	0.0617	0.6	0.8930	5.3	0.1049	3.1	662	12	661	18	662	12	2.9
TS-35	4	546	0.0658	1.7	1.1500	16.5	0.1254	5.7	795	35	795	39	795	35	4.4
TS-35	23	715	0.0677	2.1	1.2460	10.4	0.1339	5.5	853	39	843	40	853	39	5.2
TS-35	69	836	0.0709	0.5	1.5030	5.5	0.1542	2.8	953	11	953	24	953	11	3.0
TS-35	2	2286	0.0726	1.4	1.8810	5.2	0.1880	2.6	998	29	1107.1	25	998	29	-11.3
TS-35	36	1984	0.0726	0.6	1.6160	4.5	0.1619	2.5	1004	13	967.5	22	1004	13	3.6
TS-35	29	1009	0.0733	3.0	1.7490	5.3	0.1727	2.7	1029	36	1027	26	1029	36	0.2
TS-35	37	8933	0.0742	2.8	1.8860	5.8	0.1871	2.8	1048	62	1107	28	1048	62	-5.4
TS-35	65	2563	0.0748	0.7	1.7710	4.2	0.1730	2.7	1063	15	1030.1	24	1063	15	3.2
TS-35	91	1709	0.0753	1.3	2.0040	4.1	0.1929	2.6	1072	26	1136.7	26	1072	26	-6.1
TS-35	88	2641	0.0761	1.0	1.7380	5.0	0.1682	2.6	1100	21	1003	23	1100	21	8.9
TS-35	61	19108	0.0765	1.6	1.9820	4.7	0.1860	2.5	1105	14	1099.4	25	1105	14	0.5
TS-35	43	2470	0.0757	2.9	1.9760	5.6	0.1882	2.7	1107	29	1112	27	1107	29	-0.5

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-35	63	2069	0.0771	2.2	1.9420	5.7	0.1828	3.0	1122	47	1089	28	1122	47	3.6
TS-35	75	556	0.0785	1.5	1.9770	5.0	0.1863	2.8	1155	30	1102	26	1155	30	4.7
TS-35	32	1772	0.0774	3.1	2.1360	5.6	0.1980	2.8	1169	42	1164	29	1169	42	0.4
TS-35	34	1712	0.0788	1.4	2.2490	4.9	0.2047	2.9	1172	30	1204	30	1172	30	-2.4
TS-35	93	210	0.0798	4.4	2.0970	6.2	0.1899	3.2	1191	47	1123	34	1191	47	5.7
TS-35	72	1323	0.0795	1.1	2.1080	4.5	0.1943	2.6	1192	25	1145.5	26	1192	25	4.0
TS-35	19	373	0.0812	2.8	2.1740	6.4	0.1981	3.5	1211	58	1170	34	1211	58	3.9
TS-35	6	1744	0.0881	1.1	2.9340	5.8	0.2409	3.0	1382	20	1390	32	1382	20	-0.8
TS-35	38	5925	0.0882	0.5	2.9360	4.8	0.2409	2.5	1387	10	1392.1	31	1387	10	-0.3
TS-35	109	1242	0.0884	2.9	2.8200	10.3	0.2313	3.1	1397	56	1373	32	1397	56	4.0
TS-35	1	676	0.0904	2.1	2.6900	8.9	0.2239	4.4	1429	40	1334	48	1429	40	9.0
TS-35	62	22820	0.0907	1.7	3.0970	4.8	0.2463	2.6	1441	15	1419	33	1441	15	1.5
TS-35	47	588	0.0911	4.2	2.8800	8.7	0.2334	3.4	1453	70	1365	35	1453	70	7.0
TS-35	116	1619	0.0911	1.5	3.0560	5.2	0.2432	2.8	1457	33	1404	33	1457	33	3.7
TS-35	5	16240	0.0991	2.7	3.8600	6.7	0.2849	3.1	1619	53	1619	42	1619	53	0.2
TS-35	80	2100	0.1008	1.5	4.4130	5.4	0.3105	2.8	1634	28	1743	39	1634	28	-6.7
TS-35	90	24009	0.1009	0.5	3.7880	4.2	0.2730	2.6	1640	10	1558	34	1640	10	5.1
TS-35	96	15850	0.1011	1.4	4.0800	6.9	0.2919	3.3	1641	26	1659	43	1641	26	-0.5
TS-35	9	3762	0.1009	0.5	4.0140	5.0	0.2880	2.5	1643	11	1633	36	1643	11	0.6
TS-35	70	86150	0.1008	0.9	4.1010	4.6	0.2967	2.4	1644.9	9.3	1674.9	36	1644.9	9.3	-1.8
TS-35	99	6400	0.1014	0.9	4.1650	5.8	0.2964	2.9	1649	17	1671	40	1649	17	-1.5
TS-35	86	2693	0.1017	2.3	4.1740	5.0	0.2948	2.6	1652	17	1665	38	1652	17	-0.8
TS-35	17	7720	0.1016	0.7	4.0690	5.2	0.2923	2.7	1652	12	1654	39	1652	12	-0.1
TS-35	98	859	0.1018	2.6	4.1600	7.0	0.2972	3.2	1657	49	1680	41	1657	49	-1.1
TS-35	92	2400	0.1020	1.6	4.3860	6.2	0.3075	2.8	1661	32	1724	39	1661	32	-4.0
TS-35	110	61250	0.1023	0.4	4.0770	4.7	0.2844	2.5	1665.4	7.3	1613.2	35	1665.4	7.3	3.1
TS-35	94	2324	0.1019	1.7	4.4040	4.8	0.3102	2.5	1672	15	1742	38	1672	15	-4.2
TS-35	117	2745	0.1030	1.9	4.1900	7.9	0.2950	2.9	1673	36	1666	40	1673	36	0.4
TS-35	52	209600	0.1028	0.4	4.2030	4.8	0.2962	2.4	1674.4	7.8	1672.3	36	1674.4	7.8	0.1
TS-35	39	1372	0.1035	2.6	4.2200	5.9	0.2972	2.8	1675	51	1678	41	1675	51	-0.1
TS-35	100	2160	0.1030	2.1	4.2770	4.9	0.2980	2.8	1677	17	1684	42	1677	17	-0.4
TS-35	27	12188	0.1028	1.5	4.1720	4.8	0.2897	2.6	1679	14	1640	38	1679	14	2.3
TS-35	78	904	0.1034	1.9	4.1500	5.3	0.2961	2.9	1683	37	1671	39	1683	37	0.7

Table A.1 Continued

Sample	Analysis	206Pb/ 204Pb	207Pb/ 206Pb	±(%)	207Pb/ 235U	±(%)	206Pb/ 238U	±(%)	207Pb/ 206Pb Age	±(Ma)	206Pb/ 238U Age	±(Ma)	Best Age (Ma)	±(Ma)	Discordance (%)
TS-35	46	10758	0.1032	0.6	4.3350	4.6	0.3018	2.4	1684	11	1701.3	37	1684	11	-1.0
TS-35	120	1449	0.1030	2.0	4.0390	4.7	0.2859	2.8	1685	37	1631	38	1685	37	3.8
TS-35	22	846	0.1038	1.8	3.9310	5.3	0.2745	2.9	1688	35	1566	38	1688	35	7.4
TS-35	11	2350	0.1039	0.7	4.3150	4.6	0.2988	2.5	1695	13	1690	39	1695	13	0.6
TS-35	41	4674	0.1039	0.6	4.2740	5.4	0.3004	2.9	1696	12	1694	42	1696	12	0.2
TS-35	102	7528	0.1041	1.2	4.0400	5.2	0.2811	3.1	1698	20	1599	43	1698	20	5.8
TS-35	119	1174	0.1042	1.4	3.8070	5.8	0.2705	2.8	1703	26	1547	35	1703	26	9.4
TS-35	112	2848	0.1049	1.3	4.3200	5.3	0.2968	2.9	1710	23	1676	40	1710	23	2.0
TS-35	15	1910	0.1046	1.8	4.3330	6.7	0.2983	2.5	1711	30	1683	38	1711	30	1.6
TS-35	33	2780	0.1047	1.5	4.4350	5.9	0.3037	2.8	1715	30	1717	40	1715	30	0.3
TS-35	54	3800	0.1043	1.8	4.3520	5.1	0.3011	2.6	1718	22	1697	38	1718	22	1.2
TS-35	81	4814	0.1053	0.7	4.1290	6.1	0.2892	2.7	1719	13	1636	38	1719	13	4.8
TS-35	18	1299	0.1049	3.1	4.1500	6.5	0.2882	3.2	1723	57	1638	42	1723	57	5.3
TS-35	76	681	0.1056	2.1	4.3900	5.7	0.3010	2.9	1728	38	1693	40	1728	38	1.9
TS-35	44	1704	0.1055	2.1	4.3060	6.0	0.2979	2.8	1730	37	1679	39	1730	37	2.7
TS-35	103	8519	0.1059	1.4	4.5800	7.6	0.3134	3.0	1733	30	1757	44	1733	30	-1.4
TS-35	24	2179	0.1062	0.8	4.2770	4.7	0.2915	2.7	1734	14	1649	37	1734	14	4.9
TS-35	121	5124	0.1064	1.9	4.2130	4.7	0.2857	2.5	1734	23	1620	36	1734	23	6.6
TS-35	114	3240	0.1073	1.3	4.4650	5.4	0.3043	2.8	1752	24	1713	41	1752	24	2.3
TS-35	123	60020	0.1091	1.3	4.7220	4.7	0.3137	2.5	1783	13	1759	38	1783	13	1.3
TS-35	118	29750	0.1103	0.6	4.4490	6.3	0.2928	2.5	1804	11	1656.6	36	1804	11	8.2
TS-35	26	10720	0.1675	0.4	11.3040	4.6	0.4853	2.5	2532.7	6.6	2550	51	2532.7	6.6	-0.7

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